(2)

NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

COCOM, TECHNOLOGY TRANSFER AND
ITS IMPACT ON NATIONAL SECURITY

by

Warren E. Rhoades, III

June 1989

Thesis Advisor: Edward J. Laurance

Approved for public release; distribution is unlimited

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION AVAILABILITY OF REPORT Approved for public release; distribution is unlimited
2b DECLASSIFICATION DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION Naval Postgraduate School 6b OFFICE SYMBOL (If applicable) Code 56	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School
6c ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000	7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000
8a NAME OF FUNDING SPONSORING ORGANIZATION 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO

11 TITLE (Include Security Classification)
COCOM, TECHNOLOGY TRANSFER AND ITS IMPACT ON NATIONAL SECURITY

12 PERSONAL AUTHOR(S)
Rhoades, Warren E., III

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Master's Thesis	FROM _____ TO _____	1989, June	154

16 SUPPLEMENTARY NOTATION
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB GROUP	COCOM; Technology Transfer; The Toshiba Incident; Export Controls

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This thesis looks at six key members of the Paris-based, Coordinating Committee for Multilateral Exports (COCOM), as well as the Soviet methods of acquiring Western technology. The Soviet acquisition of Western technology is a pressing concern for the Western world and will continue to grow. In analyzing the shortcomings of COCOM and the policy making process in West Germany, Great Britain, United States, France, Italy, and Japan, various propositions are identified which explain the flow of technology moving east. Critical variables include: the informal nature of COCOM itself, each country's commercial orientation, the lack of national security input when conducting export transactions, the specific country's political will and technological proficiency, the amount of trade the specific country does with the Soviet bloc in conjunction with their export process, laws and sanctions against violators as well as their participation within COCOM. Policy remedies based on the research are suggested.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT	21 ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	Unclassified
22a NAME OF RESPONSIBLE INDIVIDUAL Prof. Edward J. Laurance	22b TELEPHONE (Include Area Code) (408) 646-2831 22c OFFICE SYMBOL Code 56Lk

U.S. Government Printing Office 1986—606-24.

Approved for public release; distribution is unlimited

COCOM, Technology Transfer and Its Impact
on National Security

by

Warren E. Rhoades III
Lieutenant, United States Navy
B.A., Colorado State University, 1981

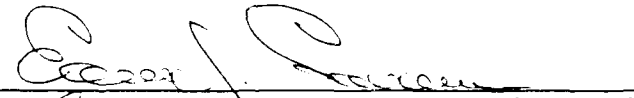
Submitted in partial fulfillment of the
requirements for the degree of

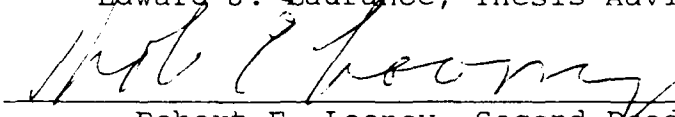
MASTER OF ARTS IN NATIONAL SECURITY AFFAIRS

from the

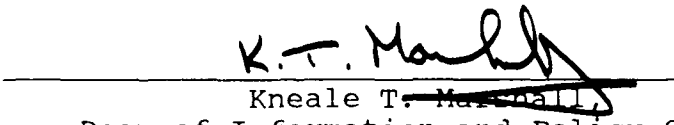
NAVAL POSTGRADUATE SCHOOL
June 1989

Author: 
Warren E. Rhoades III

Approved by: 
Edward J. Laurance, Thesis Advisor


Robert E. Looney, Second Reader


James J. Tritten, Chairman
Department of National Security Affairs


Kneale T. Marshall
Dean of Information and Policy Science

ABSTRACT

This thesis looks at six key members of the Paris-based, Coordinating Committee for Multilateral Exports (COCOM), as well as the Soviet methods of acquiring Western technology. The Soviet acquisition of Western technology is a pressing concern for the Western world and will continue to grow. In analyzing the shortcomings of COCOM and the policy making process in West Germany, Great Britain, United States, France, Italy, and Japan, various propositions are identified which explain the flow of technology moving east. Critical variables include: the informal nature of COCOM itself, each country's commercial orientation, the lack of national security input when conducting export transactions, the specific country's political will and technological proficiency, the amount of trade the specific country does with the Soviet bloc in conjunction with their export process, laws and sanctions against violators, as well as their participation within COCOM. Policy remedies based on the research are suggested.

TABLE OF CONTENTS

I. INTRODUCTION AND RESEARCH DESIGN

A. INTRODUCTION

During my first few months at the Naval Postgraduate School, while discussing the U.S. maritime strategy in one of my classes, the topic of resupplying Europe and Japan came up in class. At this same time, it had just been discovered that Toshiba Marine, a subsidiary of the Toshiba Corporation, had sold computerized milling machines to the Soviet Union. This sale was causing quite a stir within Congress and was receiving wide publicity throughout the entire media. In class, it was brought up that in event of war with the Soviet Union, NATO and Japanese forces would only be able to hold out for so long, before they would have to be reinforced and resupplied from the United States and Canada. Knowing that certain immediate personnel and logistic support could be airlifted to their specific areas of responsibility brought little relief in my mind, when realizing that the bulk of these reinforcements would have to move to Europe and Japan by sea. The fact that our allies (in this case Japan and Norway) gave the Soviet Union the improved capability of interdicting this effort, by selling them computerized milling machines which will make the Soviet submarine force an even more potent threat, inspired me to find out why.

In looking into this unauthorized sale of strategic technology, I came across an organization that I had never heard of before, "COCOM." I discovered that this acronym stood for the "Coordinating Committee for Multilateral Exports." Later I found out that this organization, which is made up of NATO, minus Iceland, plus Japan, is the only multilateral organization in the Western alliance which coordinates the flow of strategic technology to the Soviet Union.

After learning about this organization and its tremendous responsibilities, I started asking myself a few more questions. Why was it that I have never heard of this committee before? I knew about NATO and even learned about the U.S./Japanese security treaty, but I had never heard of COCOM. After looking further into the Toshiba Incident, I started coming up with more questions. Why did these two countries (Norway and Japan), who are members of this organization, violate COCOM's rules? Why didn't COCOM lay sanctions on these two countries for violating the rules? Why would any country in this organization want to violate these rules, anyway? Why didn't any senior naval, or in the case of Japan, Maritime Self-Defense Force Admirals, warn their respective countries of the consequences of this transaction? In an attempt to answer these questions, I became immersed in the technology transfer argument, which motivated me to write this thesis.

B. PROBLEM

The Soviet acquisition of Western technology is one of the most pressing concerns to the national security of the Western world. The Coordinating Committee for Multilateral Export Controls (COCOM) is the international organization responsible for regulating the technology flow to the Soviet Bloc. This informal organization, which is strictly voluntary and has no charter, has undergone numerous changes since its inception just prior to World War II. This organization was initiated by the United States, and the United States has been the driving force behind export controls, since the establishment of COCOM. However, the control of exports was much easier in the late '40s and early 50s, because the United States was in possession of most of the new technological developments. As technology proliferates so does the problem of controlling strategic technology to the Soviet Bloc.

COCOM is made up of NATO, minus Iceland plus Japan. Each country is responsible for regulating and controlling their own exports. Among the membership of COCOM these controls vary in severity and effectiveness from fairly substantial in the United States, to none at all in Spain, Portugal, Turkey, etc. This needs to be put in proper prospective though, because most countries at the low end of the spectrum are not very technologically proficient. However, countries at the high end of the spectrum are

substantially proficient in various technologies, and their ability to control exports and impose sanctions on violators has a direct effect on national security of the Western world.

The Soviet Union maintains a huge network to exploit the various weaknesses in these national systems that contain the technologies they seek. The Soviet Union, unable to develop certain technologies on their own, maintain this network to acquire needed innovations both through legal and illegal means in order to save billions of dollars and contribute to their military industrial complex.

No country is totally immune from this extensive Soviet effort, but some countries resist better than others. Taking into account technological prowess, industrial base, export processes and controls, enforcement, amount of trade with the Soviet Bloc, history of export violations, number of submissions to COCOM and opinions of individuals who work within the export control process, one can identify the weak links in the system. Taking the above mentioned indicators into account, West Germany and Japan presently pose the greatest threat of diverting strategic technology to the Soviet Union.

The implications of this situation are most significant for the United States. The United States maintains the bulk of the initiative against the Soviet threat, allowing the allies to vigorously pursue strictly economic objectives.

The situation gets even further complicated as technology proliferates outside of the COCOM membership. Unless a national security perspective or opinion can be added to the economic concerns in these countries doing business with the Soviet Union, technology will continue to find its way east. Without a common standard, one that is strictly and evenly enforced among the membership of COCOM, the United States is at a disadvantage.

C. REVIEW OF THE LITERATURE

The problem of technology transfer became very public throughout the mid-1980s. With the revelation of the Toshiba incident and later the West German involvement with the Libyan chemical plant, almost all newspapers wrote numerous articles and opinions on these or related topics. Using mostly, but not exclusively, the New York Times, Washington Post, and the Christian Science Monitor's coverage of the Toshiba and other related technology security incidents, I developed an accurate description of this phenomenon.

In seeking an explanation for these technology transfers and their policy implications, I read many professional publications and policy papers that I used extensively throughout this thesis. The RAND Corporation, Department of Defense, CIA, FBIS, are just a few of the key organizations that write frequently on East-West trade and technology

transfer. The importance of the topic has also prompted the publication of very useful books.[1]

Extensive interviews were conducted with U.S. government officials with significant experience in tne area of technology transfer. From these interviews, I learned of the day to day realities of how the system works, a critical supplement to written sources on the subject. These interviews were key in helping me identify the strengths and weaknesses in the system. Dr. Stephen D. Bryen, former Deputy Under Secretary of Defense, and former Director, Defense Technology and Security Administration; Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Agency; and Mr. Dan Hoydysh, Director, Office of Technology and Policy Analysis, Department of Commerce, were a few of the individuals interviewed.

D. PROPOSITIONS

In researching this topic and attempting to identify why some countries leak more than others, one can develop various propositions which explain the flow of technology to

---

1. The two most recently published books that best explain the magnitude of the problem today are Selling the Rope to Hang Capitalism and The New Wizard War. Some of the books I used to document the history of export controls, and the interaction between the Soviet Union and the member nations of COCOM are: Technology Control, Competition, and National Security: Conflict and Consensus; National Security and Technology Transfer: Strategic Dimensions of East-West Trade; Siberia and the Soviet Far East. (See Bibliography.)

the east. Specifically, it is hypothesized that the level of sensitive technology being transmitted to the Soviet bloc is a function of:

1. The informal nature of COCOM itself.
2. The biggest leakers having a much more commercial orientation than other countries.
3. A total lack of any national security/military perspective, input or opinion when making export transaction decisions.
4. The specific country's political will and perception of the threat.
5. A country's technological proficiency and industrial base.
6. The amount of trade the specific country does with the Soviet bloc.
7. The specific country's export process, laws, and sanctions against violators.
8. The specific country's participation in COCOM and history of export violations.

Research based on these propositions will reveal the magnitude and causes of technology leaking to the Warsaw Pact countries. Six countries--the United States, Great Britain, West Germany, Japan, Italy and France--will be examined in depth. The variation in technology transfer controls and leakage will be explained and policy remedies suggested.

II. BACKGROUND ON COCOM

A. THE EVOLUTION OF EXPORT CONTROLS AND COCOM

The Coordinating Committee for Multilateral Export Controls (COCOM) is the informal multilateral organization through which the United States and its allies attempt to coordinate the national controls they apply over the export of strategic materials and technology to the Communist world. The origins of export controls, which later led to the formation of COCOM, can be traced back to 1948. The U.S. Department of Commerce placed mandatory or "validated" licensing controls on most exports to the Communist bloc shortly after the Communist coup in Czechoslovakia. In general, every American export, except those to Canada, required some type of export license. These were broad authorizations that led to the most formidable and perplexing problem of commodity identification and classification. It was obvious that not every commodity was of strategic significance and warranted imposing restrictions on its export to the Soviet bloc. To address this and related problems, the United States initiated the export control bureaucracy which exists today.

The first piece of legislation adopted by Congress over the administration of exports was the Export Control Act of 1949. This was a compromise between the executive branch

and Congress in the regulation of exports as they pertained to national security and in fulfilling our international responsibilities to Marshall Plan participants. It was during this time that the initial bureaucracy was formed to compile lists of applicable items. These lists identified goods of various degrees of strategic importance, and it is these original lists that have been renewed periodically ever since. The Export Control Act of 1949 initiated the major policy guidance, administration and enforcement machinery governing export controls as they exist today in the United States, as well as within COCOM.

On September 27, 1950, Congress passed the Cannon Amendment, which required the United States to terminate all economic and financial assistance to any country whose trade with the Soviet Union was found by the National Security Council to be "contrary to the security interests of the United States."[1] The amendment was applicable only during periods when the Armed Forces of the United States were actively engaged in hostilities while carrying out a decision of the United Nations Security Council (i.e., Korea).

The Cannon Amendment reflected growing congressional concern over the lack of uniformity in export control between the United States and its allies in Western Europe,

---

1. Nathaniel McKitterick, East-West Trade: The Background of U.S. Policy, New York: Twentieth Century Fund, Inc., 1966, p. 12.

all of them at the time being recipients of Marshall Plan aid. This amendment's immediate issue was trade with Communist China; the British had recognized the Peking regime before the Korean War and trade between Britain and China contained some goods embargoed by the United States. It was evident that controls on East-West trade were less stringent in Western Europe than in the United States, a pattern which still exists today.

Early in 1949 the British and the French had drawn up a joint list of strategic items similar to, but less comprehensive than, the currently existing U.S. lists. They tried to use their lists as the basis for a series of bilateral agreements with all Marshall Plan countries, including the United States. However, it was soon evident that a multilateral negotiation would be more suitable. In November of 1949 a joint "Consultative Group" was established in Paris which included the nations of NATO (minus Iceland) and Japan. The day to day work of the Consultative Group was delegated to two sub-groups, the Coordinating Committee (COCOM), which began functioning in January 1950, and the China Committee (CHINCOM), which was not established until September 1952 when Japan joined the group. The working groups have been adding to and subtracting from agreed international lists of "strategic" items ever since. The two committees were merged in 1957, with only COCOM surviving. The whole exercise was and still

is completely voluntary, and the rule of unanimity prevails. In short, the "international lists" represented from the beginning, and still represent, the lowest common denominator of agreement upon East-West trade controls which exists in the Free World alliance.[2]

Because it is an informal and voluntary organization, COCOM has no power for enforcement. It is based neither on treaty nor executive agreement. Its members have no legal obligation to participate in its deliberations or to be bound by its recommendations and decisions. Furthermore, its operations have from the outset been highly confidential and its activities, at least in Europe, attract little or no publicity. It has been suggested that if this were not the case, some non-U.S. members might be forced to withdraw from COCOM, either because of internal domestic pressures or the incompatibility of individual country domestic laws with its controls.[3]

Legislation like the Export Control Act of 1949 and later the Battle Act in 1951 attempted to use U.S. aid as a lever to compel allied compliance on export controls. It was this enormous economic force that initially brought COCOM into being and held it together in the aftermath of

---

2. McKitterick, East-West Trade: The Background of U.S. Policy, p. 13.

3. United States Congress, Office of Technology Assessment, Technology and East-West Trade, New Jersey, Allanheld, Osmun & Co., Inc., 1981, p. 154.

World War II and the early years of the cold war. The amount of U.S. economic and military aid to Western Europe began to decline seriously after 1955. As it decreased, Western European trade with the East began to rise, although the above legislation provided sanctions to countries who exported restricted commodities to Communist countries. The sanctions have never been invoked, but whether this is due to success in limiting East-West trade, or to high-level policy decision to avoid sensitive confrontations, is unclear. In any case, the increasing interdependence of all COCOM members with the East at economic, political, and diplomatic levels has eliminated whatever leverage that actually existed. However, the United States is still the driving force in upgrading COCOM's strength and it is generally perceived in both Europe and Japan that COCOM is a useful institution in limiting strategic technology to the Soviet Union.

B. THE COCOM LISTS

COCOM maintains three lists of embargoed goods to the Soviet bloc: (1) the munitions list that includes all military items, (2) the atomic energy list, including sources of fissionable material and their components, and (3) the industrial/commercial or dual use list. Each COCOM country maintains its own national export control lists in addition to multilateral lists. Only the United States has

national lists which are more restrictive than those of COCOM.[4]

By their very nature, munitions and nuclear materials have clear military purposes and strategic importance, and there is generally little debate over the wisdom of restricting their sale. The industrial list, on the other hand, contains those dual-use items (e.g., jet engines, air traffic control equipment, computers) that, although nominally civilian, have military potential. It is this dual use technology that produces the varying attitudes in Western European countries toward East-West trade. The technological content of these dual-use items in the industrial list is usually high.

The industrial list is subdivided into three categories: International List 1 (embargoed items); International List 2 (quantitatively controlled items); and International List 3 (exchange of information and surveillance items). List 1 contains those items that member nations agree not to sell to the Communist bloc unless permission is specifically granted after a request for an exception. List 2 contains items that may be exported, but only in specified quantities. Licenses to export more than the quantity specified for a given item, requires special exceptions. List 3 contains items that may be sold, but over which the

---

4. Angela S. Yergin, East-West Technology Transfer: European Perspectives, Beverly Hills: Sage Publications, Inc., 1980, p. 10.

exporting nation must maintain surveillance of end use. This information as well as documentation of the sale must be reported to COCOM.[5]

Most of the dual-use items that pose the greatest problems for export controls are contained in List 1, which is divided into ten individual groupings. These conform closely to those on the U.S. Commodity Control List (CCL):

1. metalworking machinery.
2. chemical and petroleum equipment.
3. electrical and power-generating equipment.
4. general industrial equipment.
5. transportation equipment.
6. electronic and precision instruments.
7. metals, minerals, and their manufacture.
8. chemicals and metalloids.
9. petroleum products.
10. rubber and rubber products.

The COCOM list itself is not public information, but it is virtually identical to the national lists of controlled items published by some COCOM members. Furthermore, the American CCL distinguishes between multilaterally and unilaterally controlled items, and the content of the COCOM

---

5. Office of Technology Assessment, Technology and East-West Trade, p. 155.

industrial list can be inferred simply by subtracting the forme. from the latter.[6]

At the outset, COCOM controls, at least as measured by the number of items on the lists, were quite stringent, although never as restrictive as U.S. unilateral controls. Debate among and within member countries on the relative weight that should be given to security concerns and trade advantages has been continuous. In order to accommodate this debate and to keep lists current, periodic list reviews for purposes of deletion, addition and amendment are undertaken at periodic intervals. No details of the decisions made in these reviews or the debates surrounding them are ever published. However, a comparison of U.S. and other national lists indicates that the overall trend in COCOM has been toward liberalization of controls.[7]

C. INTERNATIONAL PRESSURES

Western European countries, given their varying attitudes toward East-West trade and technology transfer, have also differed in their assessment of the value of COCOM. COCOM worked fairly well in the 50's but the most documented strain on the organization was the 1962-63 NATO steel pipe embargo. In November 1962, the United States

---

6. Office of Technology Assessment, Technology and East-West Trade, p. 156.

7. Office of Technology Assessment, Technology and East-West Trade, p. 156.

tried to prevent its allies from exporting large diameter steel pipe to the Soviet bloc to impede the completion of the Friendship oil pipeline from the USSR to Eastern Europe. The pipe embargo order was passed in NATO because the United States knew that the British would not agree to it in COCOM, and COCOM regulations require unanimity. Several noteworthy points emerged from this attempt to prevent a technology transfer. Washington was able to prevail upon West Germany to force several German corporations to cancel already concluded deals for the sale of pipe, causing an outcry in the business community. Since the United States did not have as much political leverage over its other NATO allies as it did over West Germany, it was unable to prevent Britain, Italy or Japan from selling similar steel pipe to the Soviets. Ultimately, not only did the Soviet Union find alternative sources of supply for pipe, but the embargo induced it to step up the development of its own pipe making capacity. The completion of the Friendship pipeline was delayed by only a year as a result of the embargo. Moveover, there was strong suspicion in most European capitals that the real American motivation for the embargo was not fear of enhancing Soviet military capabilities, but rather, fear on the part of U.S. oil companies that the Soviets would dump cheap oil on the Western European market. Whatever the truth of this perception, the net result was that it created an atmosphere of mistrust in U.S.-West

European relations and it had only a marginal effect on the completion of the pipeline, which among other things, supplied Red Army troops in Eastern Europe.[8]

The pipe embargo has not been forgotten in Western Europe and the issues it raised remain important to the perceptions of Western Europeans of the utility of export controls and of the U.S. role in them. The basic themes that recur are the suspected hypocrisy of the United States, its overzealousness in enforcing stricter controls than necessary, and the basic ineffectiveness of such controls in preventing the acquisition of technology or technical capacity in the Communist bloc.

D. DOMESTIC PRESSURES

It also needs to be noted that the debate over export controls is not unique to just multilateral restrictions within the members of COCOM. There is constant heated debate within the U.S. over our own self-induced export controls. The United States' unilateral technology controls affect U.S. trade performance it two ways: directly, as a result of the loss of sales when a license is denied; and indirectly, by discouraging future sales when the uncertainties inherent in the licensing process creates the belief among foreign countries that U.S. companies are unpredictable and unreliable suppliers. The issue is not

---

8. Yergin, East-West Technology Transfer: European Perspectives, p. 12.

only national security, but also the use of export sanctions to achieve foreign policy goals, which are sometimes achieved to the detriment of individual corporate losses of both image and finances. Most examples of the direct effect of export controls, resulting from loss of sales, have been the result of foreign policy controls rather than strategic goods and technology controls. The most celebrated example is the graduated series of foreign policy controls associated with another Soviet natural gas pipeline similar to the one spoken about earlier. Controls were first placed on the export of oil and gas exploration or production equipment and technology to the Soviet Union in response to Soviet actions considered damaging to U.S. foreign policy interests. Validated licensing requirements for energy-related equipment and technology were increased in 1978 in response to human rights concerns relating to the Shcharansky trial. Responding to the Soviet invasion of Afghanistan, significant new controls were imposed in 1979. These restrictions were increased in 1981 following the suppression of civil rights in Poland.[9]

Among the U.S. companies affected by these control measures, was the construction equipment manufacturer, Caterpillar. This U.S. firm and Komatsu of Japan are the

---

9. James P. Moore, Jr., "A Commerce Department Perspective on Export Controls," in: Bernard L. Seward Jr., Technology Control, Competition, and National Security: Conflict and Consensus, New York: University Press of America, Inc., p. 33.

only major producers of pipelaying machinery. During the period between 1981 and 1983, before the restrictive controls were rescinded, Komatsu completed sales of approximately $500 million to the Soviet Union for pipelaying machinery. Needless to say, Caterpillar made none. Use of these sanctions for foreign policy pressure is becoming increasingly ineffective with the growing availability of alternative suppliers.[10]

E. STRATEGIC TECHNOLOGY APPROACH

Although the debate over export controls and how they should be conducted rages on in this country as well as in COCOM, there is still a general consensus that it is a useful organization. Most all COCOM nations agree that the West must attempt to coordinate their East-West technology transfer policies, particularly with regard to strategic goods, so as not to enhance Soviet military capabilities. Although both West Germany and the United Kingdom accept the continued need for COCOM's existence, there is some skepticism in these as well as in other countries about the degree to which it can slow the development of Soviet technological capacity. In addition, neither West Germany, Britain nor France accept the U.S. concept of what constitutes strategic technology. This disagreement about

---

10. A. Coskun Samli, Technology Transfer: Geographic, Economic, Cultural, and Technical Dimensions, Westport: Greenwood Press, Inc., 1985, p. 57.

definitions of technology was exacerbated by the adoption in the United States of the "critical technology" approach in the Export Administration Act of 1979. The critical technology stems directly from the findings and recommendations of a report prepared for the Department of Defense in 1976, An Analysis of Export Control of U.S. Technology--A DOD Perspective, known as the Bucy Report.[11]

Differentiating between "evolutionary" and "revolutionary" technology, the Bucy Report recommends severely restricting the export of design and manufacturing know-how while lessening export controls on certain machinery. Export controls should focus on the intrinsic use of the product, and not on its intended end-use, if the latter is clearly nonmilitary. The critical technology approach is predicated on the assumption implicit in the Bucy Report that "one can select the subset of technologies of significant military value on which our national military technology superiority can be presumed to be most dependent." The Bucy Report assumes that it is possible to differentiate between technology and equipment, and recommends more extensive export controls on the former, while lessening controls on the sale of end products. The 1979 U.S. Export Administration Act includes a provision clarifying the roles of the Secretary of Commerce and the

---

11. J. Fred Bucy, Defense Board Task Force on Export of U.S. Technology, "An Analysis of Export Control of U.S. Technology: A DOD Perspective," February 1976.

Secretary of Defense in maintaining a list of critical goods and military technologies subject to national security export controls. Some European countries dispute the validity of the "critical technology" approach as a means of establishing criteria for export controls. Although this concept is embodied in U.S. law, and not in COCOM, it has become a subject of discussion within the multilateral forum.[12]

It is generally recognized in Europe and the United States that the COCOM lists are so narrow that they have a limited effect on East-West trade, but are broad enough to affect the military capabilities of the Warsaw Pact. The United States continues to press for the strengthening of export controls, despite the internal disputes both within the U.S. as well as in the Western alliance. This never-ending effort over how best to protect Western military security while still stimulating economic growth rages on. Moreover, because COCOM is a voluntary organization and there are no sanctions against violators (at least published sanctions), it is sometimes difficult to enforce compliance, and suspicions about violations persist.[13]

---

12. Yergin, East-West Technology Transfer: European Perspectives, p. 13.

13. Yergin, East-West Technology Transfer: European Perspectives, p. 14.

F. RECENT LEGISLATION

The tensions within COCOM and the differences of opinion among the allies over East-West technology transfer have implications affecting all member nations. The repercussions of this debate have continued to effect American foreign and economic policies. The latest legislation, the Export Administration Act Amendments of 1985 (EAAA), implemented under the Reagan administration, is a continued effort by the United States for a compromise between technology control, competition and national security. This Act along with the reorganization and increased funding of U.S. control systems, as well as the increased diplomatic attention by the United States and its allies to their informal control mechanism COCOM, is the latest product of the debate. The Export Administration Act of 1985 and the increased attention to COCOM are the most recent statements of the United States' dual commitments to stopping the flow of critical technology to the Soviet bloc while hopefully increasing U.S. exports to non-Communist countries.

Under the 1985 provisions, licensing will no longer be needed for low-level technology commodities going to the other members of COCOM. Once in place this provision is expected to reduce the Commerce Department's licensing load by ten to 15 percent a year. The commodities affected are those that appear on the COCOM control-list with

administrative exceptions. Of the 47 commodities with such provisions, the greatest impact is expected to be in the area of computers, with its myriad of administrative exceptions.

The U.S. business community has long expressed its concern about apparent inequities between U.S. controls and those of our COCOM allies, which are felt to place U.S. firms at a competitive disadvantage. Controls on truly critical items, those of strategic importance, were maintained on a level consistent with those of other countries. However, U.S. controls on low-level technology were considered detrimental to U.S. competitiveness because such strategically less important items were often available from West European countries without the same restrictions. This amendment eliminated that disadvantage. This means that the U.S. business community will be on a par with our allies regarding licensing requirements on inter-COCOM trade.

The favorable treatment accorded our COCOM trading partners may also be extended to other countries if they meet the provisions set forth in this amendment. The EAAA Act mandates that if negotiations with other countries produce agreements on export restrictions comparable to those maintained by COCOM, the Commerce Department shall

treat exports to these countries in the same manner as it does exports to members of COCOM.[14]

Besides appealing to the Commerce Department, the 1985 EAAA has also benefited the Department of Defense, by streamlining the government's technology transfer controls of low technology items that are readily available from other COCOM countries. This both improves control effectiveness and minimizes any disruptive effects on legitimate exports. The DOD has been able to concentrate their efforts on the increasing Soviet effort to make illegal diversions. With the U.S. Customs services "Operation Exodus" and through major cooperative efforts with our allies in COCOM, attempts at illegal procurement of technology are being thwarted more effectively.

Not only are these activities more effective, but thanks to increased automation, the burden on the exporter is being reduced. The average license processing time has dropped significantly. The Defense Department's average processing time has been reduced from approximately 60 days to fewer than 25. In addition the DOD is working harder with exporters to find mutually acceptable conditions under which their products can be licensed.[15]

---

14. Moore, "A Commerce Department Perspective on Export Control, (I)," p. 37.

15. Talbat S. Lindstom, "A Defense Department Perspective on Export Controls," in: Bernard L. Seward, Jr., Technology Control, Competition, and National Security: Conflict and Consensus, New York: University Press of

G. ESTABLISHMENT OF DTSA

In order to focus increased attention and resources on the review and approval of export licenses, a new organization was created in May 1985, the Defense Technology Security Administration (DTSA).[16] DTSA's director is the Deputy Under Secretary of Defense for trade security policy. The deputy director is designated by the Under Secretary of Defense for research and engineering and is the Deputy Under Secretary for international programs and technology. Since DTSA's primary function is export license review, all DOD case-processing responsibilities are focused in it, and significant increases in staffing for DTSA was approved. This helped DOD meet the new, shortened statutory response times.[17]

H. IMPROVING COCOM

Another major objective of the 1985 EAAA was to increase the effectiveness of COCOM, not only by streamlining the export process, but also to improve on a unified allied response to the Soviet technology acquisition effort. At the insistence of the Department of Defense, the United States has always led the effort to improve COCOM. For

---

America, Inc., p. 48

16. Outreach Directorate, Defense Technology and Security Administration, Pamphlet, p. 4.

17. Lindstrom, "A Defense Department Perspective on Export Controls," p. 48.

reasons previously mentioned COCOM's effectiveness has lagged behind the vigorous Soviet effort to acquire western technology. Besides less than enthusiastic support from some of the member countries, it has lacked modern offices, adequate staff and secure communication facilities. More importantly, COCOM had, and still has, no capacity to carry out independent assessments. It was obvious that unless COCOM were modernized and given a boost in resources, the organization could not confront the extensive Soviet operation to exploit Western technology.

The U.S. has set aside funds to improve COCOM's operation and has worked through diplomatic channels to increase COCOM's stature as an organization to a level commensurate with its important mission. In addition, to keep up with quickly changing technology, the lists of goods and technologies COCOM bars from being exported to the Soviet bloc are now being updated on an ongoing basis. The United States has proposed that a multilateral military panel be established to act in an advisory capacity to COCOM's regular organization, since the organization currently has no in-house military expertise. There is growing acceptance of this proposal by the membership. DOD believes a consensus agreement to implement it is forthcoming. These initiatives and modernization efforts

continue to be U.S. sponsored and receive various degrees of cooperation among the membership of COCOM.[18]

I. NON-COCOM COUNTRIES

Because neither the U.S. nor other COCOM members have a monopoly on high technology, the United States is working with several non-COCOM, nonaffiliated countries that have industries producing high-technology goods such as electronics, fiber optics, and machine tools. These countries include Israel, South Korea, Taiwan, Singapore, Sweden, Switzerland to name a few. The export policies of these nations, in terms of the foreign availability of COCOM-controlled items, have always been a problem for COCOM countries. Progress is being made in this arena, and DOD believes the potential risk of technology loss through these countries has been significantly reduced. Some non-COCOM countries are, in effect, choosing to institute COCOM level of controls as their awareness grows of the risk to their security posed by increased Soviet access to Western high technology.[19]

---

18. John Konfala, "A Defense Department Perspective on Export Controls (II)," in: Bernard L. Seward, Jr., Technology Control, Competition and National Security: Conflict and Consensus, New York: University Press of America, Inc., p. 54.

19. Konfala, "A Defense Department Perspective on Export Controls (II)," p. 54.

J. THE FUTURE IMPORTANCE OF COCOM

The 1985 EAAA is the latest attempt to find the optimum compromise between how best to protect Western military security, while still stimulating economic growth and vigorous scientific enterprise. While regulating our national policies is important, the control of strategic technology varies directly with the level of united effort within the Western alliance. As noted earlier, following World War II the United States functioned as the fulcrum of technology transfer because of its preeminence in that area. By the 1980's, the situation had changed markedly. A decade ago, the United States was generating approximately 75 percent of the world's technology. The U.S. share today is estimated at 50 percent with some projections pointing to a possible decrease to 30 percent within another decade. Consequently, by the mid-1990s the amount of technology under direct control of the United States will have dropped by as much as 60 percent since World War Two.[20]

This dispersion of technology means that U.S. adversaries will have an increasing variety of locations from which to obtain strategic commodities and manufacturing know-how. Many of these countries may not share the strategic outlook of the United States, and may be willing to transfer technology to potential U.S. adversaries. One

---

20. Moore, "A Commerce Department Perspective on Export Controls (I)," p. 41.

of the crucial challenges facing the United States and its allies is to persuade such countries that the possession of crucial technologies also brings with it obligations and responsibilities. COCOM remains the single most viable organization through which U.S. and allied export controls are coordinated.

For whatever reason, either in spite of, or because of its informal nature, progress is being made in COCOM. In the next section of this thesis, we take a close look at the huge apparatus the Soviet Union maintains to acquire Western technology, in order to identify the necessity of multilateral controls.

III. SOVIET ACQUISITION METHODS

The choice between protecting Western military security and free enterprise is a major debate both in the national and international forum. At the center of this argument are technology, and the superiority one gets from achieving a more capable military machine than his adversary. It has been said that the United States is at war. "Whether we consider this to be the Protracted Conflict initiated in 1917 by the Bolsheviks or something new brought about by the march of technology in this century, the war is taking place and it cannot be escaped."[1] Because the United States is dedicated to a strategy of stability, of being the stabilizing rather than a disturbing power, we have conceded the initiative and to a great extent been bound to a policy of reacting to Communist advances. In doing this the western world has previously, and for that matter, still relies on its superior technology to maintain the balance against superior Communist forces. It is this technical superiority that the Soviets strive to reduce, in order to close the gap in sophisticated weaponry.

The Soviet Union, unable to develop certain technologies with their own resources, have sought to acquire needed

---

1. Stefan T. Possony and J.E. Pournelle, The Strategy of Technology: Winning the Decisive War, Cambridge: University Press of Cambridge, Inc., 1970, p. 1.

innovations from the west both by legal and illegal means. Using various acquisition methods to acquire a spectrum of Western technologies, the Soviets have saved billions of dollars and have contributed significantly to their military prowess.[2] Stopping or inhibiting the Soviet's extensive acquisition of military-related Western technology in ways that are both effective and appropriate in the multinational forum, is one of the most complex and urgent issues facing the Western World today.

In some circles, such as the Department of Commerce, it is felt that this viewpoint is somewhat exaggerated, but even they concede the need for export regulations when confronted by the facts. A close look at the Soviet bureaucracy developed for acquiring western technology, along with the financial and manpower resources dedicated to this effort, would convince any skeptic of the threat. By looking at this extensive organization and the recent well documented compromise of western technology through "The Toshiba Incident," it may be possible to speculate about the validity of these accusations, and the cost to western security.

Since at least the 1930s, the Soviet Union has devoted vast amounts of its financial and manpower resources to the

---

2. Central Intelligence Agency White Paper, "Soviet Acquisition of Military Significant Western Technology: An Update," U.S. Government Printing Office, September 1985, p. 7.

acquisition of Western technology that would enhance its military power and improve the efficiency of its military manufacturing technology. Today this Soviet effort is massive, well-planned, and well-managed, a national level program approved at the highest party and governmental levels. This program involves espionage by hostile intelligence officers, overt collection by Bloc officials, acquisition by scientific exchange program participants, and illegal trade-related activity. This acquisition program is well-managed, well-funded and is operated by the key Military Industrial Commission (VPK) officials. The VPK coordinates the development of all Soviet weapons systems as well as the Soviet national-level programs to acquire Western technology.[3] Former Deputy Director of the CIA, Admiral Bobby R. Inman speaks of Soviet efforts.

> The Soviets have never been reluctant to use whatever means are available to obtain access to Western technology. They want to get their hands on advanced research and actual applications that can be quickly translated into their weapon systems. And advanced computer research, which is the heart of missile guidance systems, is at the top of the Soviets 'most wanted' list of technologies.[4]

---

3. CIA, "Soviet Acquisition of Military Significant Western Technology: An Update," p. 3.

4. Junis Ellis, "Bobby Ray Inman: The Admiral and Ex-CIA Spymaster Talks About Our War With Japan, Soviet Espionage and LeCarre's Truthful Fictions," GEO, May 1984, pp. 18-22.

A. THE SOVIET SYSTEM

The Soviets and their Warsaw pact allies have three ways of obtaining militarily significant Western technology and equipment through legal and illegal means:

1. They use their scientific and technological agreements with the west to facilitate access to the new technologies that are emerging from the Free World's applied scientific research efforts.

2. They spend their scarce hard currency (some of which is borrowed from the west), to illegally purchase controlled equipment, as well as to legally purchase uncontrolled advanced western technologies having military-industrial applications.[5]

3. They task their intelligence services to acquire illegally those U.S. and Western technologies that are classified and export controlled.[6]

The Soviet Union maintains two high level programs to manage the acquisition of Western hardware and documents, both of which are directed by the Soviet Defense Council:

First, Moscow has a program to raise the technical levels of weapons and military equipment as well as to improve the technical levels of manufacturing processes. This program is managed by the most powerful organization in defense production--the Military Industrial Commission (VPK) of the Presidium of the Council of Ministers. Mainly, although not exclusively, through intelligence channels, the VPK seeks one-of-a-kind military and dual-use hardware, blueprints, product samples, and test equipment to improve the technical levels and performance of Soviet weapons, military equipment, and defense

---

5. Jan Sejna, "Soviet and East European Acquisition Efforts: An Inside View", in Charles M. Perry and Robert L. Pfaltzgraff, Selling the Rope to Hang Capitalism?, New York: Pergamon-Brassey's International Defense Publishers, 1987, p. 70.

6. Gary K. Bertsch and John R. McIntyre, National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, Boulder: Westview Press, Inc., 1983, p. 93.

manufacturing equipment and reduce any dependency on advanced Western products. This is done in large part by exploiting and adopting design concepts embodied in acquired equipment and associated documents.

Second, the Ministry of Foreign Trade, Scientific and Technology Committee, and Soviet intelligence services administer a trade diversion program to acquire relatively large numbers of dual-use manufacturing and test equipment for direct use in production lines. This program seeks export controlled microelectronics, computer, communication, machinery, robotics, diagnostic, and other equipment to increase through output of weapon producing industries.[7]

These two programs, which apparently are administered separately, are the hub of the Soviet effort. The VPK program is principally, but not exclusively, an industrial security and counterintelligence concern for the West. It involves espionage by hostile intelligence officers, overt collection by Bloc officials, acquisition by scientific exchange program participants, and illegal trade-related activity. The trade diversion program principally involves export control and international compliance issues. Characteristics of these programs overlap, further complicating the design of adequate countermeasures:

1. Both Soviet programs seek the same products.
2. Soviet industrial ministries request technology and equipment through both programs.
3. The collection channels overlap and in some cases the same Soviet individuals (intelligence officers and others) are involved in each program.

---

7. Seward, Technology Control, Competition, and National Security: Conflict and Consensus, p. 288.

The VPK includes the top executives of most of the key Soviet defense manufacturing ministries. Full VPK membership is given to the Ministers of Aviation, Machine Building (projectiles and explosives), Defense Industry (armor and electro-optics), General Machine Building (strategic missiles and space), Communications Equipment, Radio (radars and large-scale computers), Medium Machine Building (nuclear weapons and high-energy lasers), Shipbuilding, and Electronics. It is a small but powerful group, responsible for centrally overseeing the research, development, and production of all Soviet weapon systems. It coordinates developments between its chief customer, the Ministry of Defense, and the key suppliers, the defense-industrial ministries. As the expediter for weapons development projects, it is the principal Soviet military instrument for eliminating or circumventing the inefficiencies characteristic of the Soviet economic system.[8]

As part of its responsibility to enforce schedules and to ensure that technical and performance specifications are met, the VPK translates requests for Western hardware and documents, principally by the design bureaus of 12 industries, into lists of collection requirements. It is these lists of specifically needed western technology that

---

8. Seward, Technology Control, Competition, and National Security: Conflict and Consensus, p. 289.

are distributed to the GRU and KGB, once approved by the Defense Council. These intelligence organizations develop operational plans that target specific western technologies for acquisition. Mr. Jan Sejna, a former Chief of Staff to the Czechoslovakian Minister of Defense explains that;

> Every November the Defense Council approves operational plans for the GRU and KGB. After six months, the Defense Council evaluates how successful they have been. In particularly important cases, daily monitoring takes place-for example with the 'Concorde' (known in Czechoslovakia as Concordsky).[9]

The emphasis the Soviet bloc puts into this evolution, can be summed up by Mr. Sejna in the following statement:

> Since 1959, the decision of the Soviet Defense Council has been very clear: All intelligence services--and here I am referring to my experience in Czechoslovakia--were ordered to select the best cadres, as they are called, and to prepare them for technology-related espionage work. In Czechoslovakia, we selected the best military officers from the artillery, air force, and chemical troops, all highly educated professionals. They were then trained in intelligence work for two years, and all transferred directly to commercial organizations. The danger thus presented is that these people are not just simple agents. They are professionals directed in their work from the highest levels. When we initially received the order from Moscow, 200 officers were selected in that first year for military intelligence alone, and this continued every year thereafter.[10]

Mr. Sejna goes on to say that all technologies targeted were selected by the Soviet Union. He emphasizes that it must be remembered that the intelligence services of the satellite countries are merely branches of the Soviet intelligence

---

9. Sejna, "Soviet and East European Acquisition Efforts: An Inside View," p. 71.

10. Sejna, "Soviet and East European Acquisition Efforts: An Inside View," p. 70

services, and, from a strategic viewpoint, the Soviet Union must come first.

The Soviets using these methods have been very successful in acquiring Western technology, and have increased manpower allocations to further improve their technology collection efforts. Western intelligence agencies indicate that now Soviet military designers carefully chose the Western designs, engineering approaches, and equipment most appropriate to meet their deficiencies and needs. Numerous weapon systems and platforms were derived from technology acquired from the west. Lists mentioning various systems such as fire control systems for our most recently deployed aircraft, F-14, F-15 and F-18, U.S. ballistic missile defense concepts, and missile silo concepts, are just a few in the long list of acquisitions made by the Soviet Union.[11]

Western Intelligence sources believe that the Soviets put so much faith in this effort that they proceed with difficult projects by anticipating their acquisition of the foreign know-how during project development from outside sources. The evidence strongly indicates that their decision to continue a project, stalled due to a technological bottleneck, correctly assumed the acquisition

---

11. Gary K. Bertsch and John R. McIntyre, National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, p. 99.

of the deficient technology from the west.[12] It is this theory that seems the most striking. In essence, the Soviet Union has so much faith in their espionage ability that they can count on acquiring Western technology to supplement their in-progress development of weapon-systems. The CIA has documented hundreds of cases to prove this point, the latest public example being the amazing resemblance between the U.S. and the Soviet's space shuttle.[13]

In an attempt to further appreciate this theory, one can compare this theory with the latest openly publicized compromise of Western technology, the Toshiba Incident. Knowledge of this incident is required if one is to show that this theory explains this significant breech of Western security.

B. THE TOSHIBA INCIDENT

Vital computerized propeller milling machines were compromised to the Soviet Union by the Japanese firm of Toshiba Machinery Company, a subsidiary which is 51 percent owned by the Toshiba Corporation, and the Norwegian state-owned company of Kongsberg Vaapenfabrikk. The Japanese firm sold the Soviets the milling machines, while the Norwegian firm sold the computer controls that operate these

---

12. Jack Vorona, "Technology Transfer and Soviet Military R&D," in: Perry and Pfaltzgraff, Selling the Rope to Hang Capitalism, p. 20.

13. CIA White Paper, "Soviet Acquisition of Military Significant Western Technology: An Update," pp. 31-34.

sophisticated machines. These two sales were a premeditated violation of the rules of the Coordinating Committee for Multilateral Export Controls (COCOM), an organization that oversees trade between the West and the Communist bloc. The COCOM rules prohibit industrialized Western democracies from exporting certain high technology and strategic materials to the Eastern bloc countries. These milling machines will allow the Soviets to mass produce quieter warship propellers, making them harder to locate by western detection methods. At the time of this Toshiba, Kongsberg transaction, it was common knowledge that the Soviet Union was engaged in a major initiative to catch up with American quieting technology, the key to making any submarine fleet safe from detection.[14] This equipment was high on the list of technologies that the Western Allies and Japan bar from export to the Soviet bloc. Depending on the source, estimates anywhere from $30 to $50 billion will be required to develop new electronic devices to regain the tactical advantage the U.S. enjoyed before the Soviets received this new equipment. These milling machines, which enable the Soviet Union to produce significantly quieter propellers, threaten the entire Western alliance.[15]

---

14. David E. Sanger, "A Bizarre Deal Diverts Vital Tools to Russians," New York Times, 12 June 1987, p. Q2.

15. Senator Heinz rebuttal on the Senate floor, of Assistant Secretary of Defense, Richard Armmitage assessment of the damage done by the Toshiba/Kongsberg sale. Congressional Record--Senate, Wednesday 16 March 1988, p.

This transaction was initiated when suspected KGB agents approached WAKO KOEKI, a small Japanese trading firm with offices in Moscow. The Soviets indicated they needed to import large numerically controlled machine tools, precision instruments that can reduce by months the long process of making a propeller. Wako Koeki approached Toshiba Machine, who then sent a Toshiba executive to Moscow to negotiate the contract.[16] This deal culminated in the delivery of 4 nine-axis-type propeller milling machines to the Soviet Union in 1982-83. These machines are worth four to five million dollars apiece, stand approximately two stories tall, and can precision cut and shape propellers from nine different angles at the same time, to produce a 270,000 pound, 30 ft in diameter propeller. Under the regulations adopted by COCOM, which sets exports rules, no machine tool with more than three independent axes is to be exported to the Soviet Union or its allies.[17]

S2355.

Representative Dan Daniel, Virginia, statement before the House Armed Services Committee, H.R. 2948 and H.R. 2974, 22 July 1987, p. 2.

Jerome Cahill, "Ban on Toshiba Asked in Senate," New York Daily News, 19 June 1987, p. C14.

16. Sanger, "A Bizarre Deal Diverts Vital Tools to Russians," p. 1.

17. Sanger, "A Bizarre Deal Diverts Vital Tools to Russians," p. 3.

Encouraged by the success of the 1982-83 transaction, Toshiba Marine delivered four more five-axis-type numerically controlled milling machines in 1984. These five-axis machines are the second largest of the propeller milling machines, smaller only than the nine-axis machines, delivered a year earlier. It was previously thought that the Soviets were using Toshiba's nine-axis machines to make submarine propellers. The United States now believes that the smaller five-axis machines were used in the making of submarine propellers and the larger nine-axis devices are used for aircraft carriers or other large ships. The Soviets now have under construction, and are about to deploy their first large aircraft carrier, the Tbilisi (formerly called the Leonid Brezhnev).[18]

Toshiba could have provided the entire computer package for the operation of these milling machines, as they did do in the case of the five-axis machines. In the case of the nine-axis machines, the Soviets, for some unknown reason, insisted on using computer controls from Kongsberg Trade, the marketing arm of Kongsberg Vaapenfabrikk.[19] It was at this time that the Soviets contacted Bernard Green, a British national and the Kongsberg Trading Company's sales manager who supervised the sale of the $2 million dollar

---

18. Sen. Jesse Helms (R, NC), "Toshiba--A Pattern of Betrayal," Congressional Record, 19 June 1987, p. S8372.

19. Sanger, "A Bizarre Deal Diverts Vital Tools to Russians," p. 2.

numerical controller (the computer that guides the system) to the Soviets.[20]

Once the Soviets completed these transactions, both Toshiba Marine and Kongsberg began a series of deceptions to obtain export licenses for moving the equipment past Japanese and Norwegian custom officials. Toshiba applied to the Ministry of International Trade and Industry (MITI) for a permit to ship machines limited to two axes, well within the COCOM rules. The Japanese authorities overlooked the fact that the model number indicated for shipment wasn't mentioned anywhere in Toshiba's sales brochure. Toshiba said that the machinery was going to be used for a civilian purpose of improving the electric power utility in Leningrad.[21]

The Ministry of International Trade and Industry had simply trusted that the company was telling the truth. None of the ministry's 30 export control inspectors, who review 200,000 applications a year, questioned the permit. The system, which was a trust relationship between industry and government, broke down.

Mr. Bernard Green applied with the Norwegian Trade Ministry to export a numerical controller that Kongsberg specifically manufactures for Soviet-bloc trade because it

---

20. David Silverberg, "Results Mixed on Norwegian Push to Stem Technology Leak Damage," Defense News, 29 June 1987, p. 4.

21. Helms, "A Pattern of Betrayal," p. S8372.

can be used only in less sophisticated two-axis milling machines. Investigators say Mr. Green had made an oral agreement with the Soviet Union to ship a variant of the computer that could control a nine-axis machine. The difference between the two models lies in microscopic circuitry and no customs official would be able to tell the difference.[22] Both governments involved depended heavily on the truthfulness of the companies that were seeking to profit from increased trade with the Soviet Union. The governmental inspectors in both cases appeared to lack the technological sophistication to challenge the companies' claims about the capabilities of the equipment being exported.

Once the export permits were received and the machinery exported, both Toshiba Machine engineers and Kongsberg computer specialists worked side by side in Leningrad to fine-tune the milling machines. This assembly process took months to accomplish, where workers were taken through the back gate of the Baltic Shipyard and worked under the constant observation of the KGB. As part of the deal, the Soviet Union even obtained a five-year service agreement.[23]

---

22. Stuart Auerbach, "Another High-Tech Sale to Soviets by Toshiba Reported," Washington Post, 20 June 1987, p. C2.

23. Sanger, "A Bizarre Deal Diverts Vital Tools to Russians," p. 1.

There are two different versions concerning how the scheme was uncovered by western authorities. The American version indicated that the Pentagon received a series of clues with respect to Soviet submarines, and then worked backwards. There is some speculation that Soviet submarines might have been producing fainter propeller noises, and Pentagon officials put the pieces of the puzzle together which led them to Toshiba Machine.[24] According to the Japanese, a disgruntled employee of Wako Koeki told officials of Wako and Toshiba Machine that he would disclose the story of the illegal exports unless he was paid to remain silent. When he got nowhere, he carried out his threat by writing a letter to COCOM in Paris. That information was sent to the United States and eventually relayed to Japan. The employee denies the accusations of blackmail and claims he wrote the letter because the transaction endangered Japan's security and that of the whole free world.[25]

In any event, the Japanese were first notified of the illegal proceedings by COCOM in December 1985. During June 1986, the United States notified Japan and told MITI that Toshiba Machine might have illegally shipped milling

---

24. Steven Bryen, "The Toshiba Case of Transfer of High Technology," NPR Radio WETA FM Washington, D. C. 27 June 1987.

25. Takashi Oka, "Toshiba Whistle Blower Defends Decision to Expose Company," Christian Science Monitor, 22 July 1987, p. 28.

machines to Moscow. MITI contacted Toshiba Marine on both occasions, each time Toshiba Machine maintained that it only had shipped the two-axis machine. It wasn't until Secretary of Defense Weinberger complained directly to Japan's Defense Minister with detailed information in December 1986, that a full investigation was initiated. It was this investigation that confirmed the transaction and further tied in the Norwegian Kongsberg-Vaapenfabrikk company. This illegal contract earned the companies $17 million in sales.[26]

In both cases, management wanted to bolster their ailing companies and personal profit was not the motive. For the sake of one more sale and $17 million in profit to their companies, they compromised the free world to the tune of approximately $30 to $50 billion dollars. American outrage caused severe friction between the U.S. and its close military allies, Norway and Japan. It will cost the Soviet Union far less to produce quiet propellers with the new machines than for the United States to develop advanced sensors to make up for the loss.[27]

Once the situation became common knowledge, both American and Japanese governments took immediate action to calm the outrage in Congress over the sale. Toshiba immediately tried to put distance between itself and its

---

26. "Japan Alerted to Toshiba's Exports to Soviets," Baltimore Sun, 3 July 1987, p. 1D.

27. Heinz, Congressional Record--Senate, p. S2355.

subsidiary Toshiba Machine, and claimed no knowledge of the transaction and insisted that the subsidiary acted independently. The Japanese government immediately suspended all exports to communist countries by Toshiba Machine for a period of one year. Kongsberg permanently suspended all sales to the Soviet Union and closed its Eastern bloc trading arm.[28] Both the Japanese and Norwegian governments started immediate investigations which ended up in a total restructuring of their export process. Both Norway and Japan started a heavy lobbying process as well, in an effort to try and stop mounting congressional retaliation against them. The congressional furor got so out of hand, that the Reagan administration had to intervene with the threat to veto any over zealous legislation.

In any event, this incident severely strained relations between the United States, Japan and Norway, if not just from the technology leak standpoint, then by the out-of-proportion punishment and generally punitive attitude of the United States. Everyone's actions were not conducive to NATO solidarity, especially at a time when a unified response and policy was proven necessary to stop further leaks. It always seems that everyone reacts after the fact, although it has been well known that the Soviets seek Western technology. Why was propeller technology so

---

28. "Norwegian Defense Firm Stops Sales to Communist Nations," Detroit News, 18 June 1987, p. 3.

important? It is important to qualify the Soviet motivation for acquiring the computerized milling machines.

C. CORRELATING THE EVIDENCE

On 19 May 1985 the FBI arrested John Walker after witnessing the attempted drop of highly classified material to the Soviet Union. In the opinion of some, this arrest uncovered the greatest espionage network since the Soviets stole the blueprints for the first atomic bomb.[29] John Walker and his three accomplices, his son Michael, his brother Arthur, and Jerry Whitworth had spied for the Soviet Union over a span of 17 years prior to their arrest. The Walker-Whitworth case had potentially compromised all secure communications for at least ten years prior to their arrest. By being able to intercept Naval and possibly other armed services secure communications, the U.S. had no secrets, and it became evident to the Soviets exactly how we were detecting and tracking their submarines, by machinery and propeller cavitation noise. Throughout the 1960s and 70s the United States enjoyed a decisive superiority over the Soviet Union in the technology of submarine warfare. The U.S. Navy easily tracked noisy Soviet submarines, as well as surface ships, acoustically throughout the oceans of the world. But in the late 1970s and early 80s with the development of their new submarines, the Soviets became

---

29. John Barron, Breaking the Ring, Boston: Houghton Mifflin Company, Inc., 1987, p. 148.

significantly quieter, and frustrated some previous means of detection.[30] It wasn't until the capture of John Walker that the United States began to put the pieces of the puzzle together.

By understanding Soviet methods of technology acquisition, the Toshiba Incident, and the Walker-Whitworth espionage case, some significant correlations can be drawn between these events, to test Western Intelligence and Department of Defense claims with open-source evidence. It is the opinion of the author that the national security arguments for technology control can be substantiated by correlating the incidents that have been published in various free world publications, with known Soviet projects published in the same sources. By using only open sources, interesting parallels can be drawn, giving credence to arguments previously stated. Consider the following:

1. Soviets learn of Western detection methods as a result of acquiring access to cryptographic data from John Walker and Jerry Whitworth.

2. (1983), Soviets develop their first conventional takeoff and landing aircraft carrier and lay the keel to the initial carrier of the class in January 1983.[31] This first carrier formerly named the Leonid Brezhnev, now has been renamed the Tbilisi.

3. (1983), Soviets target Toshiba Marine and Kongsberg Vaapenfabrikk to acquire the first of the two shipments of milling machines and numerical controllers. This first shipment contained the

---

30. Barron, Breaking the Ring, p. 24.

31. "The Soviet Aircraft Carrier--An Update," Naval Forces, Vol. VII, No. II, 1986, p. 111.

largest and most sophisticated nine-axis milling machines. This equipment was delivered and set up late 1982--early 1983.

4. (1983), Soviets launch first boat of the Sierra-class SSN, and the lead boat of the Mike class SSN. The Sierra is believed to be quieter, and the Mike, also the largest attack submarine in the world, is believed to have superior performance in some respects to U.S. submarines. Both submarines are believed to be quieter than previous Soviet fast attack submarines.[32]

5. (1984), Encouraged by the success of the 82-83 transaction, Toshiba Marine delivers four more smaller five-axis-type numerically controlled milling machines in 1984.

6. (1984), Soviets launch first of yet another class of SSN, the Akula. This class further indicates the Soviet effort to incorporate better sound quieting measures.[33]

7. 5 December 1985, the Soviets launch their first conventional takeoff and landing aircraft carrier, Tbilisi. 10 December 1985, Soviets lay the keel to the second Tbilisi class aircraft carrier.[34]

9. (1985), Earlier in the year, 19 May 1985, John Walker gets arrested and the FBI uncovers severe damage to the country as a result of the spy ring lead by Walker.

10. December 1986, Japan and Norway uncovers the illegal sale of computerized milling machines to Moscow.

It seems apparent that the Soviets, having learned of the United States' tracking capability, embarked on developing three new submarine classes. The Sierra, Mike and Akula classes were developed and launched within 12

---

32. "Soviet Naval Construction Slows but Threat Grows," International Defense Review, May 1985, p. 636.

33. "Soviet Naval Construction Slows but Threat Grows," p. 636.

34. Norman Polmar, "The Soviet Navy: The New Carrier," Proceedings, August 1988, p. 66.

months of each other. At about the same time the Soviets developed, began construction, and launched their first aircraft carrier Tbilisi, shortly after their new submarines.

It seems more than coincidental that just prior to the launching of the Sierra and Mike class submarines, and just as the keel was laid on the Tbilisi, the Soviets made their move on the computerized milling machines. Making sure they got the largest and most capable machines on the first transaction, the Soviets acquired these machines just months prior to the launching of their first new SSN's. What is even more a coincidence is that these first milling machines were the largest available, able to manufacture large propellers to fit anything in their inventory, as well as their new aircraft carrier that would be launched within a couple of years.

Having been successful on their first attempt, the Soviets went back for four more milling machines. Upon receipt of the less capable machines in the second transaction, coincidentally the Akula class SSN makes its appearance about the same time. One year later the Soviets launch the Tbilisi, just as the U.S. starts to uncover the Walker case, which is then followed by the Toshiba incident.

Of course this is pure speculation on the course of events based on the open literature. It is the opinion of the author though, that this remarkable concurrence of

events is more than just a coincidence. Based on the previous information mentioned, it seems that the Soviets are able to plan on Western technology, not only during the initial stages of a project, such as the Tbilisi, but they are also able to integrate Western acquisitions directly into existing projects, such as the Sierra, Mike and Akula class submarines. It is understood that this is pure conjecture on the part of the author, but the facts that are stated in the open sources fit so well, that this inference can't be avoided.

In order to further understand how a diversion, such as the Toshiba incident could happen, a closer look at each country's export controls is required. By looking at the emphasis a certain country places on their export procedures, along with the previously discussed criteria, only then will we be able to completely understand this phenomenon. Hopefully, understanding why these diversions happen is the first step to correcting the discrepancies.

IV. TECHNOLOGY TRANSFER/EXPORT CONTROLS AND JAPAN

A. INTRODUCTION

Until recently, strategic technology usually originated from military research, and the proliferation of such innovations were easily controlled within the various military organizations. Today a large portion of the strategic technological improvements come from the civilian/commercial sector, which are then implemented into some sort of military application. Japan, a country who spends about one percent of their Gross National Product on defense, develops a significant portion of these technological improvements from their huge commercial industrial complex. This presents the enormous problem, of an adversary obtaining the civilian product, such as a computer, and then implementing the technological innovation into their own weapon systems, which then could be used against the initial manufacturing country.

As mentioned earlier, COCOM is the informal multilateral organization through which the United States and its allies attempt to coordinate the national controls they apply to the export of strategic materials and technology to the Communist Bloc. Technological superiority is what the Western world has relied upon in equipping its forces. This technical superiority is used as an off-set to the

quantitative superiority that the Warsaw Pact maintains. It is this technical superiority that the Soviets constantly strive to reduce in order to close the gap and swing their correlation of forces equation to their advantage. The technology base, as well as the export controls, vary significantly throughout the membership of COCOM. All things considered, Japan is one of the most important countries in COCOM, both in terms of its present technological base and its potential for future expansion. The strong Japanese economy, industrial base and technological prowess, is a symbol of national pride. This, coupled with their initiatives to constantly improve in these areas, clearly offer new opportunities for the Soviet Union's failing economy. If General Secretary Gorbachev is successful at lowering tensions between Japan and the Soviet Union enough to increase trade between the two countries, it will most likely increase the flow of strategic dual-use technology to the Soviet Bloc. Increased trade in the form of turn-key operations and joint ventures, combined with the previously demonstrated Japanese inability at controlling technology could adversely affect the entire Western alliance.

B. JAPAN AS A TARGET

As mentioned in Chapter III, a lot is known of the Soviet acquisition methods and their ability to obtain Western technology through both legal and illegal means.

The Soviets maintain a massive global program to acquire Western technology. Because of Japan's technical proficiency and lax export controls, it remains one of the most lucrative targets within this Soviet program.

Within the Soviet global network to acquire technology, no other country has been as notorious for being a "spy paradise" as Japan. Stanislav Levchenko, former KGB officer who defected to the United States in 1979, verified the various methods that the KGB used to acquire technology, and that Japan was the key target.[1] He concluded that the value of the technology acquired from these various operations is much greater than the annual operating costs of entire KGB. This is far from being an exaggeration, but is quite an understatement if you look at the several hundred examples of Soviet military equipment and weapons benefiting from Western technology and products.[2] The fact is that the Soviet Union has been successful in transforming Western research, development, inventiveness and productive genius into a major resource of the Soviet state. This is forcing Western nations to spend billions of dollars to overcome Soviet weapons capabilities that would not be in place if they were able to control this technology leak.

---

1. John Barron, KGB Today: The Hidden Hand, New York: Reader's Digest Press, 1983, p. 195.

2. Central Intelligence Agency, "Soviet Acquisition of Military Significant Western Technology: An Update," pp. 31-34.

The Japanese, until recently, had no laws against espionage. Soviet officials without diplomatic immunity who are caught by the Japanese police simply board an Aeroflot flight back to Moscow. It wasn't until the recently embarrassing Toshiba incident, and under pressure applied by the United States, that the Japanese decided to improve their resistance against Soviet espionage efforts. The magnitude of the problem can be fully appreciated when the Prime Minister is openly critical of the absence of anti-espionage legislation in Japan. Prime Minister Nakasone, making his view clear at the Diet and other forums, stated that there is no other country like Japan that serves as a "sanctuary for spies."[3] Mr Maloof says that the Japanese have just recently taken the steps needed to improve their export control system, which has resulted in a more through screening of applications. "Although it's ironic, I have just received a complaint from the Japanese about the amount of time it takes to process their applications in Japan now."[4] This may be a further indication of the low priority previously placed on controling strategic exports. You can't expect MITI to agressively administer a technology

---

3. FBIS, "LDP Plans to Submit Amended Anti-espionage Bill," Japan Report, 31 March 1986, pp. 38-39.

4 Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

control program, when its primary responsibility is to promote exports.

The Toshiba incident previously mentioned in Chapter II was the final straw that triggered this effort at strengthening anti-espionage legislation, as well as the tightening of export controls on strategic technology. Actually, the Toshiba incident caused this recent effort, but the triggering mechanism was the outrage within Congress over this unfortunate sale. The Toshiba incident brought public opinion to bear on the ineffectiveness of Japan's export controls. These controls, which are administered by Japan's Ministry of International Trade and Industry (MITI), had been too lax for sometime and were under constant scrutiny from the United States. This incident showed just how easily a Japanese company can circumvent the system and cause irreparable damage to Western security. These two sales were a premeditated violation of the rules of COCOM. Both governments involved depended heavily upon the truthfulness of the companies that were seeking to profit from increased trade with the Soviet Union. The government inspectors in both cases appeared to lack the technological sophistication to challenge the companies' claims about the capabilities of the equipment being exported.

C. JAPAN'S CONTROLS

The United States, which is the driving force in increasing COCOM's effectiveness, has been actively pursuing

tighter controls among the membership countries. Each country is responsible for managing its own controls. In the case of Japan, its reputation spoke for itself. Since this incident both Norway and Japan have made efforts to tighten their respective controls. Norway permanently suspended all sales to the Soviet Union and initiated a total restructuring of their export process. Japan banned Toshiba Machine from exporting to Communist countries for one year. The stiffest penalty ever imposed previously for a violation of COCOM rules was a one-month ban.[5] Penalties like this hardly discourage illegal transactions but Japan did make significant efforts to curb future sales to the Soviet bloc.

Compared to the Japanese initial system of promoting exports, no matter what their nature or destination, the efforts they made to strengthen their export controls greatly improved the system. The Japanese Diet passed a law to stiffen penalties against COCOM violators. It extends the statute of limitations from three to five years, increases the maximum prison sentence from one to five years, raises the financial penalty, and bans exports by the violator for three years.[6] MITI has taken steps within the

---

5. Chalmers Johnson, "Japanese-Soviet Relations in the Early Gorbachev Era," Asian Survey, Vol. XXVII, No. 11, November 1987, p. 1157.

6. Barbara Bradley, "Shipping Sensitive Technology to the Soviet Union-Cases Mount." Christian Science Monitor, 12 November 1987, p. 1.

agency to increase the number of staff and the budget devoted to the inspection of export licenses. Previously MITI had approximately 40 people to screen over 200,000 applications. After this incident, the staff was increased to 103 and the budget was increased five times to finance computerization.[7]

This effort, although viewed as late, was well received in Washington, especially among the American counterparts in the Pentagon responsible for controlling technology flow to the Warsaw Pact. The Defense Technology and Security Agency saw that this was a start to better export controls, but the changes made in Japan on paper are not even half as strong as those in the United States, and their application and efficiency remains to be seen. In every above-mentioned category the United States maintains tougher controls, in terms of sanctions and personnel devoted to export control and technology transfer. The biggest fundamental difference between the two systems is that the United States system is not administered by just one agency, and certainly not the agency responsible for promoting trade. In the United States the Commerce, Defense and State Departments act as a balance to each other in administering the system. Although there is a vast improvement in MITI's performance, the

---

7. Daniel Sneider, "Japan Curbs Sale of Illegal Technology to Soviet Bloc," Christian Science Monitor, 30 March 1988, p. 1.

agency is primarily charged with promoting, not restricting trade.

D. SOVIET INTEREST IN JAPANESE TECHNOLOGY

It is in the United States' best interest that controls continue to improve within Japan. The most obvious fact that the United States can count on is that the Japanese are committed to increasing their high technology base, both in quantity and quality, well into the twenty-first century. Keeping Japan's future technological prowess in mind, and the Soviet efforts to attain this technology in the past, technology flow to the east may still increase. Knowing that the Soviet Union's appetite for Western technology will continue to increase, not only in their commercial sector, but with their military industrial complex as well, it can be expected that Gorbachev will continue to make every effort to increase economic cooperation between the two countries. The energy that Gorbachev is committing to his "glasnost" and "perestroika" policies, in order to give the Soviet Union a less threatening appearance, is an example of this effort. Should Gorbachev be successful in Japan, this will have strong implications on technology transfer, and will not be in the United States' best interest. One only has to look at the impact of Western technology on the development of the present Soviet economy, and then identify the potential generators of future technology, to identify

future Soviet interests. Japan is a target now and will continue to be in the future.

E. DISTINCT FEATURES OF JAPANESE/SOVIET TRADE

One of the central components in the Soviet Union's foreign economic policy is the legal purchase of needed Western technology. This technology has been crucial to the accomplishment of planned targets and the development of export potential. The Soviets like to stress compatibility between the resource-poor developed capitalist nations and the resource-rich Soviet Union. To the Soviet Union, this makes increased technology trade look like a rational response to the international scientific-technical revolution.[8]

There are two distinct features in the structure of Soviet technology trade. The first is a preference for turn-key, co-production and specialization agreements, often financed with compensation payments. In compensation agreements goods and equipment are paid for on a credit basis with the credit to be paid off by deliveries of goods or products produced. The most common example is pipe for gas, where large-diameter pipe is purchased and paid for by deliveries of gas. The second feature is the concentration of technology imports within certain sectors, such as

---

8. Michael J. Bradshaw, "Trade and High Technology," in: Rodger Swearingen, Siberia and the Soviet Far East, Stanford: Hoover Institution Press 1987, p. 108.

chemicals, metalworking machinery, heavy vehicles, oil drilling and exploration equipment, etc. An obvious advantage of compensation agreements is that they provide technology without the expenditure of scarce Soviet foreign currency. Often the Western partner is responsible for marketing the product in the West, and therefore has a vested interest in the satisfactory performance of the Soviet plant. The incentive to the west for entering into these agreements was the availability of plentiful, relatively cheap raw materials. The major advantage for the Soviets with turn-key projects, is that they provide rapid improvements in the technical level of a given industry and depending on the degree of Western involvement, they may circumvent many of the economic and social problems associated with Soviet society.

The net impact of Western technology goes beyond the immediate benefits of improved techniques, and may have a substantial effect on other industries and regions within the domestic economy. On a national scale one can identify the resource allocation benefits relating to technology transfer. The additional increased productivity that results from using Western technology may release labor and resources for other projects. Soviet officials have reported that imported chemical plants have cut production costs, increased labor productivity, and reduced labor and raw material demands. This exemplifies the Department of

Defense argument that the resource-relating function of imported technology enables the Soviet Union to overcome domestic economic problems without having to reduce military spending. Thus to the Department of Defense, all forms of technology transfer are seen to have strategic implications.[9]

The resource rich areas where the Soviets have predominantly focused these turn-key and co-productions operations have been in Siberia and the Soviet Far East. Because of the vast distances between the Far East and European markets, the major foreign participant in the Soviet Far Eastern economy has been Japan. Japan supplies the industrial plants and equipment, and the Soviet Union supplies the raw materials. This is the distinct structure of Soviet-Japanese trade. The Soviets have indicated the importance placed on Japan's role in supporting the development of their eastern regions. The willingness with which Japan moved into this role is frequently noted in Japanese literature. "The real benefits obtained in terms of assured supplies of raw materials from Soviet sources and the huge expansion of Soviet markets for Japanese technological plants and equipment have proved phenomenal."[10]

---

9. Bradshaw, "Trade and High Technology," pp. 109-111.

10. Raymond S. Mathieson, Japan's Role in Soviet Economic Growth: Transfer of Technology Since 1965, New York: Praeger Publishers, 1979, p. 16.

It is these turn-key and co-production operations that have required the strengthening of COCOM, and contributed to the strategic technology acquisition of the Warsaw Pact. The Soviets have been able to obtain the technology needed to strengthen their military industrial complex both through legal co-production agreements and their illegal acquisitions disguised as legal transactions. In the case of the Toshiba incident, both the Norwegian numerical controller and the Japanese milling machines got by export and customs officials by deception. Because it is virtually impossible for COCOM to monitor illegal transactions among the two companies conducting the co-production agreement, there is a correlation between the amount of legal trade you conduct with the Soviet Union, and the risk of illegal diversion of strategic technology. Present and former Japanese trade officials from numerous small to medium-sized trading companies, such as Wako Koeki, the broker for the Toshiba deal, have stated that there is a great deal of pressure from the Soviet Union to procure contracts. "Often, they say, they are offered large 'inducements' from Soviet officials to bend or break rules and export proscribed commodities. All of this has led to a climate of relaxed technology security."[11]

---

11. "Technology Export: Will Japan Tighten Tech. Security?" Research and Development, September 1987, p. 39.

F. IMPACT ON THE UNITED STATES

The Japanese personnel increase to 103 people for screening export license applications was a great improvement. However, the United States employs over 750 individuals through-out government to do the same job. The United States maintains six times the number of personnel of any member within COCOM, yet it does the smallest percentage of trade with the Soviet bloc than any other member. Ironically the United States has the largest number of cases under consideration before COCOM, and prosecutes more export violators than any other nation within COCOM.[12] This also shows the competitive inequity given to the U.S. exporter because they comply with the law. Consequently, if Gorbachev is successful at making the Soviet Union appear less threatening, and this has a spin-off effect of increasing Western economic assistance to the Soviet Union, which I'm sure he is counting on, then the Japanese system may remain obsolete. By increasing the number of transactions between Japan and the Soviet bloc, this has a direct impact on the assets available to monitor and control technology transfer, which in the case of Japan, have been and will continue to be inadequate.

The key concept in controlling strategic technology within one's borders is political will. In the case of Japan, they have given a higher priority to aligning their

---

12. Interview with Michael Maloof, 10 February 1989.

foreign policy with that of the United States than with the Soviet Union. This has worked to our advantage because Japan is much more interested in maintaining good trade relations with the United States than with the Soviet Union. Although the Japanese are the second largest Western trading nation with the Soviet Union, behind West Germany, trade with the Soviet Union accounts for only two percent of Japan's total trade volume.[13] The United States remains a much larger market for Japanese goods which they are more interested in maintaining. The Toshiba incident is a perfect example of the effort and interest the Japanese have in the U.S. market. Toshiba made about $17 million on the sale of milling machines to the Soviet Union. They spent almost the same amount in the most aggressive lobbying campaign ever mounted by a foreign company to quell the anger of Congress. This was done in an effort to stop Congress from banning Toshiba's $10 billion a year sales in the United States.[14]

G. JAPAN'S FUTURE TECHNOLOGICAL DEVELOPMENT

The question is, will the United States be this fortunate in the future? With the enormous efforts that the Japanese are putting into their new "Technopolis Strategy,"

---

13. Kazuo Ogawa, "Economic Relations with Japan," in: Swearingen, Siberia and the Soviet Far East, pp. 158-160.

14. Stuart Auerbach, "How Toshiba Took the Hill by Storm," Washington Post, 10 January 1988, p. C3.

the Japanese may view Soviet natural resources in a different light, or technology under their development and possession differently than we would. The United States may find itself in a position, that even if we are the driving force in COCOM, the technology may not be ours to regulate. We may find that we won't have a leg to stand on if Japan sees it in her best interest to cultivate the Soviet market to fuel their growing technology base. The Japanese are already demanding a broader role in international affairs and the management of the world economy. During President Bush's latest visit to Tokyo, his administration was surprised by the intensity of this message delivered by Japanese Prime Minister Takeshita.[15] This assertiveness could take on a much greater role in the future, considering the Japanese investment and influence they have attained over U.S. policy.

Today, Japan finds itself in a dilemma. Westerners are reluctant to share their technology for fear of the "boomerang effect," and other Asian nations are undercutting Japan with low-cost products. Japanese researchers have caught up with and even surpassed the West in many fields. Japan must now innovate to maintain its competitiveness. Creativity has become its new industrial slogan. In order to accommodate this need, the Japanese have announced the

---

15. Jim Mann and Art Pine, "Japan Seeks Wider International Role," Monterey Herald, 22 February 1989, p. 2.

Technopolis Concept. This is the plan to build a network of nineteen high-tech cities throughout Japan.

These cities will be based on the Silicon Valley's spinoff development pattern and the Tsukuba Science City outside of Tokyo. They will offer ample housing, shopping malls, schools and universities, recreational areas, and life-long learning centers, in an effort to create new researchers and technologies. These cities will be linked by bullet trains, telecommunications networks and on-line data bases that will link researchers to the latest developments around the world. These 19 high-tech cities are considered the engines for Japan's economic growth into the twenty-first century.[16]

Japanese officials feel that the government will no longer be able to force industry to march to its tune. The previous heavy-handed approach used in regulating industry is too time-consuming and has not worked with fast-moving, high technology companies. Instead, government ministries, such as MITI, must anticipate, cultivate, and promote emerging technologies and markets in which Japan has a competitive advantage.[17] It will be interesting to see how much attention will be placed on controlling strategic

---

16. Sheridan Tatsuno, The Technopolis Strategy: Japan, High Technology and the Control of the Twenty-First Century, New York: Prentice Hall Press, 1986, p. XV.

17. Tatsuno, The Technopolis Strategy: Japan, High Technology and the Control of the Twenty-First Century, p. 35.

technology if the government is to reduce its management of industry. As mentioned earlier, MITI is the same organization that is presently responsible for controlling technology exports, as pointed out, with questionable efficiency. With no military or defense input on screening export applications today, what will be the impact in the future fast-paced world, where regulating industry is considered to be too time consuming? One thing that can be counted upon is that the Soviet Union will do whatever is possible to take advantage of the situation. The Soviet initiative is presently in full swing.

H. RECENT SOVIET INTIATIVES WITH JAPAN

For the first time in 16 years, a "Japan Industrial Exposition" was opened in Moscow from 15-24 October 1986. The Soviets indicated that they were primarily interested in joint ventures in automobile parts and electronics. General Secretary Gorbachev made overtures to Japan, saying "We are hoping Japanese companies provide a stimulant to vitalize the Soviet economy." Earlier in the year Sumitomo Group, made up of 20 companies including such high-tech companies as NEC and Sumitomo Electric Industries, extended for another five years an agreement to exchange scientific technology with the Soviet Union. Group leaders noted that the Soviets were interested in NEC's communication equipment and optical fiber technology produced by Sumitomo Electric.

Japanese officials concluded that the Soviets are aiming for the introduction of Japan's advanced technology.[18]

The Soviet Union's economic rapprochement with the countries of the West is progressing at an increasingly rapid pace. At the forefront of their initiative is Japan. On September 8, 1986 Deputy Chairman Marchuk, USSR Council of Ministers who was attending the Japanese-Soviet Science and Technology Cooperation meeting announced new joint venture legislation which went into effect on 1 January 1987. This announcement was first conveyed to Japan among the Western industrialized countries and is evidence that the Soviet Union wants Japanese technology. The Soviet Union is also granting wider authority among its bureaucracy to negotiate with Western countries, this authority being previously limited to the Soviet Ministry of Foreign Trade. Twenty ministries and agencies along with 70 major companies will be permitted to use foreign currency and will be able to negotiate directly with Western companies for purchases of equipment and exports of manufactured goods. Through these series of measures, including joint ventures with the West, business cooperation with the Soviet Union will become easier. The purpoe of the Soviet Union's hasty rapprochement with Japan is restoring its own economy.

---

18. FBIS, "Recent Status of Industrial Cooperation with USSR," Japan Report, 20 February 1987, pp. 30-36.

Japanese economic experts on the Soviet Union are unanimous on the view.[19]

In this atmosphere, the Japanese export controls and anti-espionage legislation, even though they have undergone recent renovation, may still be inadequate. The United States has always been, and still is, the key proponent for strong export controls on strategic technology. This is the function of the size of our defense budget and our desire to maintain a superior edge in the quality of weapon systems. If the Japanese spent as much as the United States does on defense, then they too would be concerned with the regulation of technology. It would be logical to assume that they would at least confer with their defense establishment to ponder the repercussions of the export. It is easy to put technology transfer low on one's priorities, when a ally is committed to maintaining the technological advantage over the potentially common adversary. Under the present conditions, with the benefits of the U.S. defense umbrella its easy to see things from the economic perspective.

I. POSSIBLE FUTURE SOVIET MOVES

For the time being, it is the priority the Japanese place on the U.S. market, the fear of Congressional repercussions and the distrust of the Soviet Union, that

---

19. FBIS, "USSR Aims at Japan's High Technology," Japan Report, 5 March 1987, pp. 52-57.

motivates them to support export controls. Gorbachev and the Soviet Union will continue to seek every means possible to change these priorities. Within Japanese-Soviet relations there is a key issue that still has not been resolved and dates back to the end of World War II. This issue has been the return of the four islands, collectively known as the Northern Territories, which run north to Kamchatka from the eastern end of Hokkaido. Japan refuses to sign a treaty ending that Pacific war until the Soviet Union returns these islands to Japan. This issue is a matter of national pride, and a solidifying common argument among all the diverse political factions in Japan. Japan as a country remains committed to the recovery of the Northern Territories. The Northern Territories dispute is a central issue in any emerging relationship, and serves as an adversarial symbol between the two nations.[20]

There is a great incentive for the Soviet Union to consider returning these islands. Full normalization of relations between the two countries is possible through the return of all four islands, and such a event would be a true political coup for a Prime Minister. Should this happen, it could further modify Japan's perception of the Soviet Union and be influential in Japan's debate over its national security relationship with the United States. It would most

---

20. James F. Giblin Jr., "National Strategies and Japan's Northern Territories," Naval War College Review, Winter 1987, p. 53.

certainly lead to a significant expansion in Japanese investment in Siberia and result in an increasing dependence on Soviet trade by Japan's economy, a situation that would significantly decrease the role of the U.S. in technology control.

The significance of the technology transfer issue between the United States and Japan lies in the burden sharing breakdown of their security relationship. The amount of money the United States spends on defense could be significantly reduced by restricting the flow of technology from our COCOM allies. The countries within COCOM, such as Japan, that maintain small defense budgets, don't see this as a priority. The U.S. feels these countries are taking advantage of the U.S. defense establishment and are not doing their fair share. The COCOM countries feel that the U.S. is trying to restrict trade to give the U.S. exporter some sort of advantage. Incidents such as the Toshiba case only serve to contribute to the suspicions and sense of unfairness on the other side. It would seem that Japan and the United States need to rearrange their relationship in order to present the Soviet Union with a more united front. The longer this is delayed, the better the opportunities for the Soviet Union, and as previously explained, they will exploit every opportunity.[21]

---

21. Johnson, "Japanese-Soviet Relations in the Early Gorbachev Era," p. 1160.

Many feel that if the United States pulled out of COCOM, the organization would dissolve in an hour.[22] The members have significantly different views regarding defense spending, burden sharing and the perceived threat of the Soviet Union. As long as the United States maintains a sufficient force in the eyes of the COCOM allies to deter Soviet aggression, the non-U.S. members can be expected to view strategic technology transfer issues from the economic point of view. None of the allies is completely innocent of serious violations of COCOM rules, but the United States is the only one trying to strengthen the organization. As technology proliferates so will the Soviet effort to obtain it. An immediate concern of the United States should be Japan, because their initiative to strengthen their technology base is second to none and it is the primary target of the Soviet Union.

Economic and trade relations between the Soviet Union and Japan have a history of being consistently very active. The future will continue to see Soviet efforts to expand trade relations both legally and illegally. The condition of the Soviet economy and the tremendous effort the Japanese are putting into further developing their technology base will put the initiative on Gorbachev. Clearly the Soviets

---

22. This view was conveyed to me by an important player, previously within the system. Interview between Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, and the author, 7 February 1989.

need Japanese technology to improve their economy more than the Japanese need the Soviets. Just how far Gorbachev is willing to go to acquire this technological help remains to be seen. The control of technology flow to the east, in which the United States has been the dominant force within COCOM, may take on a different character if the United States' technological prowess slips to Japan. But the key issue in future Japanese-U.S. relations will be in their ability to equitably distribute the burden, not only in regards to technology transfer but with defense in general.

V. TECHNOLOGY TRANSFER: COCOM AND WEST GERMANY

A. INTRODUCTION

As we have seen, the technology base, as well as the export controls vary significantly throughout the membership of COCOM. Within the Western European membership of COCOM, West Germany is the focal point of the Soviet initiative to acquire Western technology in Europe. In addition to having the largest population, technology and industrial base, West Germany is the chief military ally of the United States, and all things considered, has the weakest export controls among the industrialized Western European nations. Securing Western economic and technological inputs and implementing them into the Soviet economy is a primary objective of the Soviet Union. West Germany's inefficiency in protecting Western innovations in the above-mentioned areas clearly offers new opportunities for the Soviet Union's failing economy. If General Secretary Gorbachev is successful in lowering tensions between Western Europe, particularly West Germany and the Soviet Union, enough to increase trade between the two countries, it will increase the flow of strategic dual-use technology to the Communist bloc. Increased trade in the form of turn-key operations and joint ventures, combined with West Germany's previously demonstrated inability at controlling technology, will

adversely affect the entire Western alliance. In this chapter, I will show how West Germany plays such a key role within the membership of COCOM, and in the arena of strategic technology transfer in general.

B. SOVIET ACQUISITION METHODS

Once again, keeping in mind the extensive Soviet effort to acquire Western technology described in Chapter II, West Germany is as lucrative a target as Japan. Within the Soviet global espionage network, West Germany plays a major part in their effort to acquire Western technology. The scale of the Soviet and Eastern bloc espionage efforts directed against Western Europe is impressive both in its overall size and in the high levels of government to which it has occasionally penetrated. This was demonstrated most dramatically in 1974 when Chancellor Willy Brandt was forced to resign after one of the advisors in his cabinet was arrested as an East German agent. The scale or effectiveness of Soviet bloc espionage efforts at lower levels can only be roughly determined. Government officials in Bonn estimate that 3000 to 4000 Soviet bloc agents are active in West Germany. Other government officials place the number as high as 10,000.[1]

---

1. John Van Oudenaren, Soviet Policy Toward Western Europe: Objectives, Instruments, Results, Santa Monica: Rand Corporation, 1986, p. 102.

Richard Mueller, one of the Soviets most successful West European agents, is still at large. Mr. Mueller is a West German citizen who is wanted in both West Germany and the Unites States for completing numerous illegal exports of COCOM-controlled computers, microelectronics, and other products to the Soviet Union. His involvement with illegal technology acquisition on behalf of the Soviet bloc dates back to the early 1970s. By 1978 Mueller's deals were made almost exclusively with Soviet foreign trade officials, some of whom were intelligence officers under cover. For his network, Mueller uses numerous dummy and front firms throughout the world, and meets with his Soviet principals in Moscow to mask his activities. At one time he had more than 75 firms operating in Austria, France, Switzerland, the United Kingdom, the United States and West Germany.[2]

Between 1978 and 1983 Mueller delivered to the Soviets advanced computers, peripherals, and micro-electronics manufacturing equipment worth at least several tens of millions of dollars. Mueller is best known for his attempted diversion to the Soviet Union in late 1983 of seven large U.S. Digital Equipment Corporation VAX computers and related hardware and software. The VAX series of super minicomputers are valuable to the Soviets because of their

---

2. Central Intelligence Agency, "Soviet Acquisition of Military Significant Western Technology: An Update," p. 27.

computer-aided design (CAD) applications for microelectronics fabrication. This equipment was purchased in the United States for shipment to Mueller's dummy firms in South Africa and West Germany for diversion to the Soviet Union, but the shipment was seized enroute by Sweden and West Germany.[3]

C. WEST GERMAN RELATIONS WITH EAST GERMANY

The single most important factor that complicates the espionage problem as well as the trade diversion/illegal export problem, is West Germany's desire to improve relations with East Germany. This not only involves the monumental counter-espionage problem of identifying an East German from a West German, but entails all the emotional political arguments involved with a divided country attempting to achieve reunification. Intra-German relations are a key factor determining the West German technology transfer policies with Eastern Europe and the Soviet Union.[4] Among the West Germans, their policy of "Ostpolitik" is seen to have generated numerous political as well as economic benefits--reduced the danger of another Berlin crisis, created closer relations with East Germany, and achieved repatriation of ethnic Germans from the Soviet Union and Eastern Europe--all of these the West Germans seek to

---

3. Central Intelligence Agency, "Soviet Acquisition of Military Significant Western Technology: An Update," p. 27.

4. Yergin, East-West Technology Transfer: European Perspectives, p.23.

retain. The West German leadership is proud of the fact that a quarter of a million ethnic Germans have been allowed to resettle in West Germany since 1975. The government ascribes this success to a conciliatory policy that eschews explicit linkage of trade and emigration. Noting that many ethnic Germans still seek to leave East Germany, former Chancellor Helmut Schmidt said,

> All could come to a standstill. So you will understand that the divided nation of Germans--more than sixteen million Germans are still living in the Communist world--is not in a position to act as a spearhead or as a forerunner in a conflict between the two superpowers.[5]

It is in this atmosphere that the West Germans view trade and economic cooperation with the Soviet Union, which runs directly counter to the view point of the United States. In an interview with Dr. Stephen Bryen, when asked how West German export controls were, his reply was, "Awful, either they don't want to or they don't care about controlling technology to the Soviet Union." Dr. Bryen went on to say, "If the Toshiba incident happened in Germany, they wouldn't give a damn." When asked if this was a function of the amount of trade the West Germans do with the Soviet bloc, his reply was, "Yes, the Germans could care less, and are more interested in maintaining their relationship with the

---

5. John P. Hardt and Kate S. Tomlinson, "Soviet Economic Policies in Western Europe", in: John Van Oudenaren, Soviet Policy Toward Western Europe, p. 187.

Soviet Union than worrying about sanctions from the United States."[6]

Most West European leaders are reluctant to return to the cold war era and fear that full adoption of economic sanctions would jeopardize the gains achieved during the late 60s and early 1970s, specifically reduction in tensions in Europe and increased trade with the East. Intra-German trade is today more highly politicized than is West German trade with other communist countries, and its chief aim is to improve political contacts between the two countries and to facilitate family reunification and create a more favorable environment in West Berlin. Although, the East Germans consider their trade with West Germany as foreign trade, the West Germans do not consider their trade with East Germany to be foreign trade, because this would imply that East Germany would be a legitimate foreign country. Inter-German trade comes under a special category. Imports from East Germany are considered "supplies," while exports are called "deliveries." For political reasons, West Germany is willing to utilize technology transfer to East Germany to facilitate greater intra-German contacts. Thus in considering West German technology transfer policies toward communist countries, the United States must realize that intra-German economic relations comes under a unique

---

6. Interview with Dr. Stephen Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, 7 February 1989.

category. The West German constitution has the right to export written into it, and West Germans citizens have the right to sue the government or even the government official for inhibiting exports. This dispute is still caught up in the courts, and to date nobody has ever been found guilty of violating export rules. It is also against the law in West Germany to extradite, so any illegal exporter who suspects being caught finds refuge in West Germany.[7]

The Soviets realize this and exploit the situation whenever the opportunity presents itself. West Germany feels that it has reaped significant concrete results from its normalization of relations with East Germany. The Soviet Union is aware that West Germany wishes to continue to improve its contacts through trade, and will continue to work the situation to their advantage.[8]

D. COCOM AND WEST GERMANY

COCOM is supposed to oversee member countries licensing and enforcement procedures, which theoretically should all be the same. Because this organization is an informal agreement among member nations and is bound by no formal treaties, each country administers their controls independently with various degrees of effectiveness.

---

7. Serge Schmemann, "Angst and Anger in Bonn," New York Times, 16 January 1989, p. A1.

8. Yergin, East-West Technology Transfer: European Perspectives, p. 24.

Although all member countries agree on the need for export controls, the United States is clearly the dominant force in maintaining tight controls and restricting Soviet access to Western technology. West Germany, whose reputation speaks for itself, lacks the political will to improve their laws or their enforcement efforts to limit technology diversion to the Soviet Union. It is within this atmosphere that West Germany balances its relations with the west and its delicate political and economic ties with East Germany and the Soviet Union.

The West Germans are willing to trade with the Soviet bloc to enhance relations with their Eastern neighbors. Also, West Germany's highly developed industrial economy places unrestricted trade high on its political agenda. One-third of all exports goes to the Soviet bloc, and West Germany sells more goods to the Soviet Union than any other Western industrialized country. However, because of the United States and its strong post World War II relationship, the Germans look at export restrictions as necessary but difficult to administer.[9] West German participation within COCOM is clearly inadequate compared to the United States' effort. West Germany does over five times the trade with the Soviet Union, yet submits less than half the

---

9. Robyn S. Metcalfe. The New Wizard War: How The Soviets Steal U.S. High Technology and How We Give It Away, Redmond, Washington: Tempus Books of MicroSoft Press 1988, p. 175.

applications to COCOM than the United States. The amount of applications submitted by West Germany is clearly under-represented compared to the amount of trade. It is under these conditions that Dr. Stephen Bryen says "Any technology that is the least bit sensitive, is at risk in West Germany."[10]

E. WEST GERMAN EXPORT CONTROLS

The West German export controls, although adequate on paper, in actual operation do little in stopping strategic technology. The Libyan chemical plant is the recent leak that has been receiving a lot of media coverage, but this was not the first time the West Germans were implicated in a chemical plant transfer. Earlier, West German firms were linked to the construction of the chemical plant in Iraq whose products were used in the recent Iraq-Iran war.[11] Export controls over chemical/biological weapons and munitions are administered directly by the Ministry of Economics in Bonn. This review is done in coordination with the Ministries of Foreign Affairs and Defense. However, controls over technology transfers and components for chemical/biological weapons and munitions are administered by the Economic Ministry's Federal Office for Export

---

10. Interview with Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, 7 February 1989.

11. Timothy Aeppel, "Bonn Reforms Aim to Defuse Furor," Christian Science Monitor, 21 February 1989, p. 4.

controls at Frankfurt. There is no coordination with the Ministries of Defense or Foreign Affairs unless the export proves controversial. This occurrence allows for the regular export of components, which would normally be embargoed, for assembly at some offshore facility.[12]

There is also no evidence that West German officials act on their own to investigate companies. Companies generally threaten to sue the government if exports are held up. German law allows for lawsuits to be filled against individual government officials, thereby decreasing the likelihood of any official initiative to investigate. The West German government generally is reactive rather than proactive in investigating allegations of wrongdoing. "The Germans have been asked to investigate a considerable number of cases of alleged illegal diversions of technology and chemical/biological exports (more than 20). All responses revealed no violation of West German law."[13]

Mr. Maloof spoke at length, on the inadequacies of the West German controls on strategic technology.

--West German officials do not conduct pre-license or post-delivery shipment checks to insure that the commodities are reaching legitimate end-users. Consequently a considerable number of exports go through

---

12. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

13. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

Free World intermediaries, thereby increasing the chances for illegal diversion.

--West German authorities do not review an item for export in the context of how it will be incorporated into a total system. An embargoed system can be exported piecemeal to various Free World destinations and assembled offshore. This is contrary to COCOM regulations in the context of East-West transactions.

--Current German law does not permit a thorough investigation of company records without a court order. In turn, a court order cannot be obtained without substantial evidence that the firm was involved in a diversion. Consequently, officials will tip off company officials by inquiring whether it is engaged in that activity.

--Unlike U.S. export laws, German law lacks a conspiracy provision. A West German company can order controlled commodities, technology or chemical precursors, from one country and have them sent to another country without touching German soil. Consequently German officials will not act against the firm, since the activity did not violate German law.

--West German authorities generally do not require an import certificate from an importing country to insure the protection of sensitive exports from illegal diversion. For example, Swiss authorities may not know to protect a sensitive item since the West Germans may not request a Swiss blue import certificate. Invariably, the item is more likely to be diverted through a Swiss freight forwarder unbeknownst to anyone.[14]

It is in this light that one can better understand the recent West German incident with the Libyan chemical plant. This shows just how easy a diverter, with any kind of criminal initiative, can obtain and divert strategic technologies. West Germany is a lucrative target that will continue to be a weak link within the membership of COCOM.

---

14. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

F. THE LIBYAN CHEMICAL PLANT INCIDENT

West Germany has been home base for some of the best-known technology diverters. Because so much trade occurs between West Germany and the Soviet bloc, and because West Germany is a highly industrialized nation, technology smugglers can easily operate without detection. This is exactly the situation that the Soviet Union will continue to cultivate. If Gorbachev is able to create the perception of a less threatening Soviet Union, thereby increasing economic exports and technology transfer, this will further exacerbate the already ineffective West German trade controls. The West German laws and enforcement procedures are so moderate that technology diverters can operate in West Germany with impunity. As mentioned earlier, Richard Mueller and others just like him, hail from West Germany and many Soviets fronts and warehouses to transship illegal exports have West German addresses.[15] The most recent example of the West German inability to control strategic technology is occurring today with the Libyan chemical plant. The West German company Imhausen-Chemie played a central role in the design and construction of the Libyan chemical plant, which went undetected by the export controls.[16]

---

15. Metcalfe, The New Wizard War: How The Soviets Steal U.S. High Technology And How We Give It Away, p. 176.

16. Gary Milhollin, "Bonn's Proliferation Policy," New York Times, 9 January 1989, p. A-15.

On 1 January 1989, the United States government, as reported in the New York Times, reported that five West German firms were responsible for building the chemical plant in Rabta, Libya. The report indicated that the West German firm of Imhausen-Chemie played the central role and was aided by four other West German firms. In response, the West German Chancellor Helmut Kohl, quickly denied all allegations and demanded that the United States provide more evidence to back up its claims. He went on to formally criticize the administration's handling of the allegations. In the same article, Imhausen-Chemie strongly denied the allegations and the examiners from the German Finance Ministry formally cleared the company of any suspicions that it exported any chemical equipment or know-how to Libya between 1984-1988.[17]

The West German Chancellor made it seem that this was the first time he ever heard about the problem, in an effort to give the appearance that the United States wasn't playing fair, or that he hadn't had a chance to take positive action. Further investigation proved that this wasn't so. Senator John S. McCain III (R-Ariz), after attending a top-level military conference said that, "It seems increasingly apparent that the West German government first denied what it already knew to be the truth." The U.S. Embassy in West

---

17. Robert J. McCartney, "W. Germany Assails U.S. on Libyan Plant; Kohl Government Angered by News Leaks," Washington Post, 7 January 1989, p. A-14.

Germany formally notified the Foreign Minister of U.S. suspicions of West German corporate involvement in May of last year. Former Secretary of State George Schultz and CIA Director William Webster notified Kohl personally on 15 November.[18] Two West German weekly magazines Der Spiegel and Stern said that the West German authorities knew as early as two years ago about suspicious West German participation in the construction of the plant.[19] After this evidence was revealed, Bonn officials shifted course, first conceding that the allegations could be right, and then acknowledging that the West German intelligence service had provided a report of possible involvement of German companies as early as October.[20]

After all these allegations subsided, the investigation revealed just how Imhausen was able to build this plant. Mr. Jurgen Hippenstiel-Imhausen, the managing director of Imhausen, first made contact with Libya in 1985, and then used an elaborate false trail through Hong-Kong to outfit the poison-gas plant at Rabta, Libya. Mr Imhausen himself is said to have traveled to Hong Kong in November of 1984 to

---

18. Robert J. McCartney, "Bonn's 'Benign Neglect' On Poison Gas Assailed," Washington Post, 21 January 1989, p. A-29.

19. Robert J. McCartney, "Bonn Concedes Libyan Plant Can Make Chemical Weapons," Washington Post, 17 January 1989, p. A-1.

20. Serge Schmemann, "Letter Indicates More Links Between Gas-Plant Builders," New York Times, 17 January 1989, p. A-12.

set up a company called Pen-Tsao-Materia-Medica-Center Ltd., and Pen-Tsao in turn authorized Mr. Imhausen to set up a Hamburg office in April 1987. Imhausen would then formally sell supplies to Pen-Tsao, which would pretend to ship them to Hong Kong, and they would end up in Libya.[21] Further discoveries linked Imhausen's company with I.B.I. Engineering, owned by an Iraqi businessman Ihsan Barbouti, who was the principal contractor for the Libyan plant. Another West German Firm Salzgitter Industriebau or SIG, had prepared architectural plans for Imhausen, purportedly for a chemical plant in Hong Kong "Pharma 150," which incidentally is the same code name for the Libyan plant.[22] West Germany's giant electronics company Siemens AG has said that some factory-automation equipment it supplied to Imhausen, purportedly for the Hong Kong plant, never arrived there.[23] All the evidence compiled and the widening criminal investigation may have been too much for Mr. Hans-Joachim

---

21. Serge Schmemann, "In Chemical Maker's Town, Germans Silently Disbelieve," New York Times, 17 January 1989, p. A-1.

22. Serge Schmemann, "Letter Indicates More Links Between Gas-Plant Builders," New York Times, 17 January 1989, p. A-12.

23. Robert J. McCartney, "New Evidence Strengthens Suspicions of Firm's Links to Libya," Washington Post, 1 February 1989, p. A-19.

Renner the deputy manager of Imhausen-Chemie, second in charge behind Mr. Imhausen. He tried to commit suicide.[24]

As of today the investigation still continues, but the incident has put considerable strain on West German and U.S. relations. The United States for years has tried to get the West Germans to strengthen their export controls. It is the opinion of the author that the United States was tired of beating its head against the wall attempting to stop the technology leak in Germany. Fed up with the West German foot dragging on this incident, they broke the story in the papers to prove their point. Senator McCain said,

> ...the time has come to be frank....It is becoming a matter of public record that many West German companies, and some of the most senior officials and ministers of the West German government, must have known since the early 1980s that West German firms were contributing to the proliferation of chemical and biological weapons.[25]

This Libyan controversy is widely seen as the most politically damaging episode ever faced by the government of Chancellor Helmut Kohl.

G. WEST GERMANY'S PROPOSED REFORMS

As a result of this incident, Chancellor Kohl is introducing a package of reforms aimed at tightening export controls and stemming West Germany's image as a chemical

---

24. Serge Schmemann, "German Whose Company is Tied to Libya Apparently Tries Suicide," New York Times, 18 February 1989, p. A-2.

25. McCartney, "Bonn's 'Benign Neglect' On Poison Gas Assailed," p. A-29.

weapons salesman. The new system outlined will strengthen export controls, ranging from stiffer penalties for those circumventing the law to a better system of monitoring exports. In addition their export administration staff which monitors sensitive export will be nearly tripled, and a new export control division will be created in the Economics Ministry in Bonn. All these measures are aimed not just at chemicals, but for other arms-related technologies as well.[26] Mr. Maloof feels that the proposed changes will center only on chemical and biological exports and not on enhanced protection of sensitive technology transfers. In any event, this bill has yet to be endorsed by the West German Parliament, whose political orientation puts a premium on keeping exports as free of restrictions as possible. It Is projected that the West German Parliament may not act on these recommendations until late spring. Yet West Germany remains the greatest single source of illegal transfers of sensitive technology to the Warsaw Pact.[27] One thing that can be counted upon is that any attempt to limit the constitutional right to export will meet resistance from powerful export-oriented industries, and this is the string the Soviets will continue to pull.

---

26. Aeppel, "Bonn Reforms Aim to Defuse Furor," p. 4.

27. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

H. THE DOMINANCE OF THE ECONOMICS MINISTRY

The United States is pleased that the West Germans are making progress in attempting to control exports. Any movement towards strong controls is welcomed by the United States, who feels that other countries with weak controls should emulate the West German initiatives. However, in every category that West Germany is proposing to strengthen, the United States remains far superior. The biggest fundamental difference is that the United States system is not administered by any one agency. In the United States, three branches of government--Commerce, Defense and the State Department--act as a balance to each other in administering the system. While there is an attempt at improving the West German system, it will still be regulated by the Economics Ministry, which is primarily charged with promoting and not restricting trade.

It is in the United States' best interest that controls continue to improve within West Germany. West Germany's technology base, demonstrated political will to trade with the Soviet bloc and inability to control strategic technology exports, make them prime targets for the Soviet Union's acquisition methods. The effort that Gorbachev is placing on making the Soviet Union appear less threatening is an attempt to ease COCOM restrictions which are motivated by the United States. Gorbachev will continue this effort to encourage Western companies to bring high-quality,

technology-based products and know-how into the Soviet economy. West Germany is now, and will be in the future, a well sought-after technological market by the Soviet Union.

I. THE COCOM LISTS

In taking a further look at the West German political will to enforce COCOM regulations, and the differences the future might bring should these proposed laws go into effect, one must look at the past. Within COCOM there are three lists: (1) the munitions list that includes all military items, (2) the atomic list, including sources of fissionable material and their components, and (3) the industrial/commercial or dual-use list. Supposedly, the first two lists receive little argument among COCOM membership which agrees that all items on the first two lists need to be controlled for obvious reasons. It is the dual-use list that receives all the attention and argument. However, West Germany cannot even control items from the nuclear fissionable materials list, a matter that was explicitly agreed upon by the entire membership of COCOM. From 1985 to about 1987 a West German firm "Neue Technologien," used a front company to export an entire factory to Pakistan to help process uranium for bombs, plus tritium and tritium-making equipment to multiply the explosive power of Pakistan's first generation nuclear

bombs.[28] In 1984 the West German firm, Degussa, exported to India the metal beryllium, which is a reflector material that enhances the explosive power of atomic bombs. The export application was legally approved by West German authorities.[29] These exports are not only forbidden under COCOM regulations, but under the Nuclear Nonproliferation Treaty that West Germany pledged to uphold. These are only two of many illegal exports that the United States attempted to stop earlier.[30]

J. THE ABSENCE OF A MILITARY PERSPECTIVE

Exports such as the ones explained above only indicate what is well known among U.S. officials responsible for controlling strategic technology. It is evident that West Germany has little if any national security/military input or perspective in any export transaction. It is apparent that they feel, because an item falls under the dual-use category,that it won't be used for military means. This is a naive judgement on their part from a national security perspective, but the emphasis in West Germany is on exports and that's where the political priority seems to be. This seems ironic because the West Germans are the largest

---

28. Michael R. Gordon, "German Concern Said to Aid Pakistan A-Weapons," New York Times, 29 January 1989, p. A-6.

29. Stephen Engelberg, "German Atomic Sale Challenged," New York Times, 1 February 1989, p. A-2.

30. Milhollin, "Bonn's Proliferation Policy," p. A-15.

contributor to NATO behind the United States. It would seem that because of this contribution, they would coordinate their exports, or at least solicit recommendations from their defense sector. It is the defense sector that has the most to lose should their present political/economic strategy fail. The computer technology that leaks to the east today, may return in the form of Soviet missile guidance systems that will have to be dealt with tomorrow. The irony of the situation came full circle with the latest public West German incident, which is an explicit example of the lack of any rational defensive perspective whatsoever.

William Webster, the Director of the Central Intelligence Agency, reported that the West Germans may have helped Libya develop an air-to-air refueling capability that will significantly extend the range of Libya's bombers.[31] Not only will Col. Qaddafi be able to strike Israel, but also numerous other countries and cities in the area. It is ironic that the West Germans, who were victimized by terrorists in Munich during the Olympic games, are selling the required products and building a chemical weapons production plant for a known terrorist, Col. Maummer Qaddafi. They are giving him the capability to use the chemical weapons against themselves and their allies by giving him an air-to-air refueling capability that

---

31. Stephen Engelberg, "Libyans Reported to Opt For Drugs," New York Times, 2 March 1989, p. A-4.

significantly increases his range. This is clearly not a rational response for anyone with any kind of national security perspective, unless the West Germans have an entirely different opinion of Col. Qaddafi than the rest of the members of COCOM. In any event, the transaction still should have been submitted to COCOM for review.

It is this sort of attitude of maintaining exports free of restrictions that the Soviets strive to encourage. By using their agents of influence, the Soviets will play on the political issues within West Germany in order to maintain their access to West German technology. Gorbachev, through his declared policies of "perestroika" and "glasnost," is making the Soviets appear less hostile in an attempt to loosen Western export controls and create new business ties. There is a willingness on his part to make token concessions regarding dissidents, relaxation of cultural and artistic rules, and easing of media controls, in order to produce more joint ventures and turn-key operations that have an immediate effect on the Soviet economy. Their recent effort to bring high-quality technology and know-how into their economy is their newest joint ventures rules issued in early 1987. These rules allow foreign investment partners to own as much as 49 percent of the joint venture. The Soviets are now letting Western countries take out their profits in hard currency if

the joint venture produces earning's in foreign trade.[32] West Germany is a target for these good will gestures, and their political/economic situation with the Eastern bloc, sways the advantage to the Soviets. In January 1988, Soviet Foreign Minister Eduard Schevardnadze went to Bonn to encourage the West Germans to ease its exports restrictions of sensitive technology, something the Germans have been doing for some time. Of course the Soviets emphasized the close link between arms cuts and their economic reforms to give the appearance of being less threatening to further encourage help from the West Germans.[33]

Should Gorbachev succeed at convincing the West Germans to invest more in the Soviet bloc and to commit to these joint venture partnerships, then the flow of technology will continue to increase regardless of these recent initiatives the Germans are making. If the economic perspective remains the top priority in West Germany, the ability to maintain technological superiority over eastern bloc forces, a strategy that has been key in NATO force structure, will be in jeopardy. To make export decisions on dual-use technology, which implies a distinctive military application in the definition, without considering the strategic

---

32. Metcalfe, The New Wizard War: How the Soviets Steal U.S. High Technology And How We Give It Away, p. 29.

33. Elizabeth Pond, "In Bonn, Shevardnadze Pushes Arms Cuts," Christian Science Monitor, 20 January 1988, p. 7.

military implications, will not be in the best interest of the Western world.

The primary problem concerning the technology issue between the United States and West Germany revolves around their security relationship and the defense budget. Although West Germany is the second largest contributor to NATO, behind the United States, their defense budget is significantly smaller than that of the United States. The country which has the most to lose through technology transfer is the United States and consequently that is why they push the issue. If the defense budget of West Germany were as large as that of the United States, their perspective would change. The United States views the dual-use argument from a defensive perspective, the Germans see it from an economic perspective. As with Japan, the United States feels that Germany is taking advantage of its defense establishment, while West Germany feels that the U.S. is trying to restrict trade to give the U.S. exporter some sort of advantage. Until the United States shifts more of the defense burden to them, they will continue to view the situation in this manner and the Soviets will continue to take advantage of the situation. These next few years are crucial, because the thrust of the technology transfer issue will be increasingly important in 1992. With the projected economic unification of Europe, which diminishes the U.S. role on that continent, the United States may not have a leg

to stand on regarding technology transfer. To redistribute the burden now may generate a defensive perspective that will continue on into the future.

VI. EXPORT CONTROLS AND FOUR OTHER MEMBERS OF COCOM

Among the other members of COCOM there are four other countries which are important when evaluating technology transfer. By looking at the United States, Britain, France and Italy in this chapter, one may be able to draw further conclusions about each member's degree of participation. Everyone says they agree on the need to control strategic technology to the Soviet Union, yet in reality some countries just give this lip-service. By looking at these other four members and comparing them to Japan and West Germany, we can draw some conclusions regarding the previously stated propositions.

A. UNITED STATES

Examining the history of export controls in the United States is basically the mirror image of chapter II and the history of COCOM. Since the organization's inception, almost all initiatives to control technology have been spearheaded by the United States. These American initiatives in the multilateral forum have their roots in U.S. domestic policy. With the rare exception of England and France, the United States leads all member countries in maintaining the initiative and control over strategic Western technologies. This was the case in 1949 after the

establishment of COCOM, and it is still the case today.[1] Over the years, concern over technology transfer received varying degrees of initiative from the United States. The current concern over strategic technology transfer began in the 1970s during the period of detente between the United States and the Soviet Union. This concern came about due to two specific developments in U.S.-Soviet relations.

The first was the increased reliability on conventional weapons in as era of nuclear arms reduction talks. With changes in the nuclear balance, our previous strategies which depended on our nuclear arsenal no longer provided a credible deterrent. This put an increased emphasis on conventional weapons. These armaments require a broad spectrum of available technologies, many of them applicable in the commercial/industrial sector. These technologies known as "dual-use," are important to the Western world in order to maintain a qualitative advantage over the quantitative superior Soviet conventional forces. Thus qualitatively superior weapons emerged as a critical national interest.[2]

The second was American disillusionment with Soviet behavior during the era of detente. The incentives that

---

1. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

2. Vitalij Garber, "The Evolution of Tighter U.S. Export Controls," in: Perry and Pfaltzgraff, Selling the Rope to Hang Capitalism?, p. 182.

were proffered as a part of the policy of detente, "carrots," did not produce the hoped-for results. Attempts to increase Western leverage over Soviet actions by drawing the Soviet Union into a fairly liberal trade regime and technology transfer program failed. A contrary result became apparent. The Soviets had been able to save considerable expenditures of money and research effort in the implementation of their military programs, the pace of which--in spite of detente--continued unabated.[3] For example, three sales were made during the 1970's. All three of them legal at the time and all three approved with the understanding that the items would be put only to civilian use.

--The first was the sale of $1.5 billion worth of U.S. and other Western technology that allowed the Soviets to build the KAMA river truck plant in the early 1970s. The factory produced large number of military trucks that were used in the Soviet invasion of Afghanistan and by Soviet military units in Eastern Europe opposite NATO forces.

--The second unfortunate sale consisted of U.S. precision grinding machines for the production of small, high precision bearings that proved useful to Soviet missile designers. This directly benefitted the Soviet Strategic Rocket Forces who maintain the ICBM's that are pointed at the United States.

--The third sale consisted of two large floating drydocks that were sold to the Soviet Union in 1978 and diverted shortly thereafter to military use. Such drydocks are of critical importance for the repair of ships damaged in warfare, and each of those sold can carry several naval vessels. They have been used over the years to service

---

3. Garber, "The Evolution of Tighter U.S. Export Controls," p. 183.

KIEV class aircraft carriers, destroyers, and submarines carrying ballistic missiles.[4]

It is because of the above mentioned reasons, coupled with the Soviet invasion of Afghanistan, that ended this period of detente with virtually all trade in high technology with the Soviet bloc terminated. In order to better administer and control the American export system, as well as monitor the Soviet acquisitions world-wide, the Defense Technology and Security Administration was developed. This organization developed under the Reagan administration, and punctuated the renewed American commitment to control strategic technology leakage.

B. AMERICAN LEAKAGE

As mentioned earlier, no-country is immune to the massive Soviet effort to acquire Western technology. One of the prerequisites of the whole process is to be a generator, or in possession of the technology needed by the Soviet Union. Because of the United States' technological proficiency, which in terms of defense contractors represents well over 100 industries, the Soviet effort within the United States is enormous.[5] Because of this

---

4. Allan Wendt, "U.S. Export Control Policy: Its Present and Future Course," Current Policy, No. 1094, United States Department of State, Bureau of Public Affairs, Washington D.C., 14 June 1988, p. 1.

5. Central Intelligence Agency, "Soviet Acquisition of Military Significant Western Technology: An Update," pp. 18-23.

technological proficiency, the United States is not without its disappointments. Various diversions have resulted in more than 190 indictments since 1981, well documented by the Department of Justice.

Between 1977 and 1980, Werner Bruchhausen smuggled more than $8 million worth of high technology and military equipment through various front companies in California to other from companies in Europe and on to Soviet customers. Bruchhausen owned and controlled at least 12 corporations in California and two in West Germany. His operation was based primarily in Southern California, and with the help of three accomplices became firmly established in the illegal business of selling strategic technologies to the Soviets.

Bruchhausen ran one of the most successful supply routes of U.S. high technology to the Soviet Union in the late 1970s, using his offices in California and Germany to export equipment to both the Soviet Union and other Eastern bloc customers. Although he specialized in finding semiconductor manufacturing equipment for the Soviets, he also assisted them in acquiring electronic testing equipment, communications systems, computers, and computer components. By the time Bruchhausen was apprehended, the Soviets had received Data General Eclipse computers, Fairchild test equipment, semiconductor manufacturing equipment, antenna equipment, microwave tuners, Memorex disk drives, Intel single-board computers, and Motorola microcircuits.

Although the equipment was worth only about $8 million in the United States, eager Soviets had parted with at least $30 million of their precious hard currency. The Soviet purchases often came in pairs, one for the purpose of reverse engineering, and another for use in military general scientific research, or industrial applications.[6]

In another embarrassment mentioned in Chapter III, former naval warrant officer John Walker and his family operated without detection for 17 years before being captured. The magnitude of his diversions will be felt for many years to come, and possibly jeopardized American serviceman's lives as far back as the Vietnam era. Mr Walker's diversion of military technical manuals to secure voice encoding devices, along with keying material, allowed the Soviet Union to manufacture the same machines to decode secure voice transmissions. As indicated earlier, this compromise had devastating implications on the United States.[7]

The United States hasn't been immune to illegal Chemical diversion either. An Iranian diplomat stationed in West Germany arranged three shipments in 1987 and 1988 of

---

6. Metcalfe, The New Wizard War: How the Soviets Steal U.S. High Technology, and How We Give It Away, pp. 2-3.

7. U.S. Congress, Senate Committee on Governmental Affairs, Permanent Sub-Committee on Investigations, Foreign Missions Act on Espionage Activities in the United States, Hearings, Washington D.C.: Government Printing Office, 1986, p. 103. Also, Barron, Breaking the Ring, p. 148.

chemicals to make mustard gas. The diplomat directed a West German company, Chemco G.m.b.h., to buy chemicals from Alcolac International of Baltimore. The shipments were routed through companies in Greece and Singapore to conceal their true destination. Alcolac officials said that the chemicals had been sent to Iran without their knowledge. Under American law, export of the specific chemicals involved anywhere require an export license, and shipments to Iran, Iraq and Syria are barred.

During the investigation, an official of the German firm who was an accomplice for the Iranian diplomat was caught an arrested in the United States. He later pleaded guilty to violating American export law. That official, Peter Walaschek, at first agreed to cooperate with prosecutors by wearing a hidden microphone as an informant for the Customs service. But on 1 December he fled the country and flew to West Germany, forfeiting his $350,000 bond. The man remains free in West Germany because a spokesman at the embassy in Washington said Mr. Walaschek could not be charged with any violations of German law, because the transactions had taken place outside the country. They also said that Mr. Walaschek cannot be forced to return to the United States for trial because German law does not provide for

extradition.[8] This is a recent example of the points made about West Germany in Chapter V.

C. FUNCTION OF TECHNICAL PROFICIENCY, AND U.S. ENFORCEMENT

As long as the United States remains a technologically proficient nation, illegal diversion will occur by incorrigible adversaries from various nations, particularly the Soviet Union. The United States realizes this and is leading the Western response with various initiatives, some of which were explained in Chapter II. All legislation, enforcement efforts, and private initiatives that the United States has brought into the multilateral forum in COCOM, have been implemented in some form here in the United States. As said before, the United States leads and maintains the initiative in controlling strategic dual-use technology throughout the Western world. At the forefront of these U.S. initiatives is its own domestic export processes, export regulations, and sanctions against violators that are unparalleled in the Western world.

The Libyan chemical plant incident in the case of West Germany, and the Toshiba incident in the case of Japan, show where the interests of the U.S. government and the U.S. exporter converge, contrary to the other members of COCOM. National security demands tighter technology security

---

8. Michael R. Gordon, "Iran is Expanding Chemical Stocks Used In Poison Gas: Embassy in Bonn is Key," New York Times, 19 January 1989, p. A-1.

throughout the Western alliance. COCOM nations vary in their approach in attacking the problem, and none come close to the American effort. For example, the United States assigns several hundreds of officials throughout the Departments of State, Commerce and Defense (over 750), to review license applications and to enforce export control regulations. The United States Export Administration Act of 1985 punishes violators of these regulations with prison terms of up to ten years. The Department of Defense, which has the biggest stake in the success of export controls, plays a vigorous role in U.S. government policy making. The Defense Technology and Security Administration reviews all proposed sales of exports of controlled goods to the Soviet bloc and can raise its objections to the President of the United States. By contrast, German and Japanese defense agencies played no role whatsoever in the recent incidents described in the previous chapters.[9]

The most lopsided statistic is in the key area of enforcement of a country's existing export regulations, where the United States is also in the lead. Since 1981 the United States has indicted approximately 192 cases for violation of export regulations and other related offenses. Out of these cases, numerous individuals have been found guilty and are serving prison sentences or paying millions

---

9. Stephen D. Bryen, "Forward" to Metacalfe, The New Wizard War: How the Soviets Steal U.S. High Technology and How We Give It Away, p. 10.

of dollars in fines, or both.[10] In contrast, Mr. Maloof says that,

> ...compared to the United States, there have been almost no prosecutions in COCOM countries for violations of export laws. Japan took Toshiba Marine officials to trial, found them guilty and gave them a suspended sentence. Norway just put Bernard Green behind bars for two years, but these were real high visibility cases, and that is about all there has ever been.[11]

This is just one of the many examples of the lack of reciprocity among the membership of COCOM. It also shows the inequity toward the U.S. exporter, who is forced to comply with the law, unlike his counterparts in other member nations of COCOM. This is also why Western security is jeopardized, because the Soviets will take the path of least resistance to acquire whatever technology they need. Any unilateral decisions to control specific technologies will be ineffective, if the Soviets can go to the next country to acquire what they need with less resistance. This situation gets increasingly more complicated as technology moves outside the membership of COCOM.

D. GREAT BRITAIN

Britain, like all Western countries, has hosted various smugglers who have used the country as a way station for

---

10. Export Control Enforcement Unit, Internal Security Section, Criminal Division, U.S. Department of Justice, "Significant Export Control Cases, January 1, 1981 to January 23, 1989."

11. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

Western technology bound for the Soviet Union. One of the most recent British citizens, Brian Butcher, a second-hand electronics dealer and convicted "technobandit," is suing his government to protect him from American export controls. The British government is opposing Butcher in the British High Court and is very proud of its record against export violators.[12]

Britain, whose technology base is substantial, but less than the United States, Japan or West Germany, is considered one of the most conscientious Western European countries among the membership of COCOM. When asked about the British technology controls, Dr. Stephen Bryen says, "The British controls are similar to ours, they act very responsibly in transferring technology to the Soviet bloc." Dr. Bryen went on to say that "the United States and British license submissions to COCOM are the only ones that are anywhere near reality, compared to the amount of trade with the Soviet bloc."[13] Mr. Maloof says that "Britain is one of the rare allies that make proposals to add to the COCOM control list, instead of the other member nations, who are constantly asking to reduce the items on the control

---

12. Pamela Sherrid, "Tackling the Technobandit at Lower Cost," U.S. News & World Report, 1 February 1988, p. 36.

13. Interview with Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, 7 February 1989.

list."[14] In general, Great Britain takes a similar stance as the United States, as to the importance of controlling strategic technology. The British administer their program accordingly.

E. FRENCH CONTROLS

The French take a middle-of-the-road stand on technology transfer. France openly criticizes Soviet political and economic policy but is willing both to trade with the Eastern bloc and to subsidize interest rates on loans to those countries. Still, France cooperates with the United States in restricting higher technology exports, and shares the U.S. commitment to keeping strategic and military critical equipment out of Soviet hands. In 1981, the French government under President Francois Mitterrand, created a commission for the protection of its own advanced technologies. France monitors its own licensing procedures on high-technology exports and also audits U.S. goods that arrive in their country. Still, because compliance with COCOM rules is voluntary, France sometimes removes items from COCOM consideration and acts independently.[15]

France was implicated in the Toshiba incident through accusations by both Norway and Japan. They accused the

---

14. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

15. Metcalfe, The New Wizard War: How the Soviets Steal U.S. High Technology and How We Give It Away, p. 176.

French firm of Ratier-Forest of sending machine-tools to the Soviet Union prior to the Toshiba transaction, but the company went bankrupt before the French investigation could come to any conclusions.[16] In April, four men were arrested for breaking a French counterespionage law even though their crime involved illegal shipments rather than spying. A French machine-tool manufacturer sold machinery used to produce turbine blades for jet engines. The French government's use of the counter-espionage statute instead of a lessor export charge was meant to send a message to the United States of the increased French effort to enforce COCOM agreements.[17]

Prior to President Mitterrand's election, France was considered a legendary haven for spies. In 1983, France expelled 47 Soviet spies in an unprecedented act in Franco-Soviet relations. France said there was extensive evidence of widespread scientific and technological espionage, particularly in the military field.[18] This housecleaning effort sent the message to Moscow that France could no longer be counted on to look the other way.

---

16. E.S. Browning, "Illicit Sales Made to Soviets by French Firm," Wall Street Journal, 19 October 1987, p. 27.

17. E.S. Browning, "Four Executives in France Are Arrested for Exports of Technology to the Soviets," Wall Street Journal, 25 April 1988, p. 23.

18. Margaret Murray, "Real Goal of Soviets' Global Spy Network," U.S. News & World Report, 18 April 1983, ps. 31-32.

Dr. Bryen seemed fairly optimistic about the French effort, which may have been a relative assessment when viewed in the context of other members' control efforts. When asked about the French export controls, his reply was "up and down." Since the election of President Mitterrand in 1981, the French have made good improvement in their export controls, but just recently they may be slipping some." When asked about this recent decline, his reply was, "because defense is playing a lessor role in the decision making process. In France, specifically General Henri Conze was a key player and influence in strengthening control of technology exports to the Soviet Union."[19] Mr. Maloof indicated that there was a growing concern in France that President Mitterrand is under pressure from the Interior Minister to open up trade with the Soviet Union in order to take advantage of the economic opportunities, which conflicts with their previous hardline.[20] Both interviews led me to believe that although France occasionally acts independently, it was not an immediate area of concern for stopping strategic technology moving east.

---

19. Interview with Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, 7 February 1989.

20. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

F. ITALIAN CONTROLS

There is not too much published in the open literature on Italian capabilities to control strategic technology. In every interview I conducted though, when asked how Italian controls were, everyone replied "suspect." Dr. Bryen, however, was a little more adamant.

> Italy is a sieve. Bigger companies that have a large international reputation are pretty responsible because they have a lot to lose in the world market, like Fiat. But the smaller companies that are on the fence are really suspect. Generally speaking in Italy, the smaller the company the greater the risk of illegal technology exports.[21]

Mr. Maloof added that "Some corporations in countries that have a large or significant communist party, don't even submit transactions to COCOM. They export straight to the Soviet bloc, due to the influence of the indigenous communist party. Moscow will give kickbacks and increased funding to these parties for completed transactions." Mr. Maloof made it clear that Italy was not the only country where this sort of thing went on.[22]

From the information described in this and previous chapters, one can draw some correlations about the various countries that contribute to the flow of strategic technology to the Soviet bloc. There are trends and

---

21. Interview with Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, 7 February 1989.

22. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

reoccurring situations that occur within the membership of COCOM, that in the opinion of the author, lead to some inescapable conclusions. Unless these situations are corrected, technology will continue to flow east.

VII. CONCLUSIONS AND RECOMMENDATIONS

In Chapter I, I put forth eight propositions that are useful in explaining the flow of strategic "dual-use" technology to the Soviet Union. By giving the reader some background on Soviet acquisition methods, history of COCOM and recent performances of some of the biggest technologically proficient nations, one can tie these propositions into each country's performance, to identify weaknesses and future priorities within the membership. If the COCOM membership concentrated on these weaknesses, in order to strengthen the organization equally across the board, this would provide a stronger united front to meet the Soviet acquisition effort directly.

Should the Western alliance agree to strengthen their controls in the areas identified, this will have an immediate effect on Western security and readiness, especially in an era of nuclear arms reductions. The Western alliance would also be in a better position to negotiate with Gorbachev from a position of strength. By improving the control over their strategic technology and thereby denying the Soviets unauthorized access, the Western alliance would be able to better strike a balance in strategic trade, to ensure Gorbachev succeeds with his economic reforms without jeopardizing Western security. By

the membership of COCOM maintaining strong control, it would increase the likelihood of inducing change in the Soviet Union, ensuring that Gorbachev remains in power and nudge or encourage democratic reform.

Even with all the stirring of "glasnost," and economic reform within the Soviet Union, all initiatives to date have not resulted in any redirection of resources away from the Soviet military machine. It is unanimously agreed upon throughout the Western world that it is hard to find fault in Gorbachev's rhetoric. By taking a united stance on strategic "dual-use" technology transfer, COCOM and the Western alliance could induce change and be far more reassured by supporting Soviet actions. COCOM membership could start by improving in the following areas, which in the opinion of the author are its greatest vulnerabilities.

A. PROPOSITION 1--THE INFORMAL NATURE OF COCOM ITSELF

Although COCOM was formed during the same time period as NATO, with the same assumption that the Western alliance faces a serious threat from the Soviet bloc, COCOM remains a semi-secret organization. This organization remains virtually unknown to the general populations throughout the membership of COCOM. This is the result of some members of COCOM, who agree on the need for export controls, but find that open support of the organization to be too politically sensitive. This is why COCOM doesn't operate under a specific treaty or charter that mandates compliance.

These same countries who are unable to publicly acknowledge their participation in COCOM remove export requests from COCOM consideration or just refrain from submitting the export application altogether, because the sale in question is to economically attractive. Yet, it is also these same countries who view adverse publicity, such as that received by Japan during the Toshiba incident and publicity received by West Germany during the Libyan Chemical plant incident, as counter-productive to their efforts to exert effective control. In the opinion of the author this viewpoint is absurd. The reason the media got involved in the first place is due to the specific country's negligence and failure to respond once confronted by the situation. Had the countries involved better administered the controls they agreed to enforce the incidents wouldn't have happened in the first place.

In general, the informal nature of the system gives the individual country involved enormous leeway to administer their specific export requirements as they see fit. The problem comes about when this informal agreement directly impacts on their formal agreements, such as the NATO treaty. The nature of "dual-use" technology which specifically implies a military significance has a direct correlation to NATO readiness. This informal nature allows the economically-oriented countries such as West Germany and

Japan to export "dual-use" technologies without addressing their military implications.

1. Recommendations

Improve public awareness. This would benefit in two ways.

1. Increase the cost or repercussions that would be rendered on a company seeking to make a quick profit by illegally trading with the Soviet Union and reducing national security. The company would jeopardize its reputation by circumventing export rules thereby making the sale to costly. As mentioned earlier by Dr. Bryen, in Italy the larger companies with the international reputations are pretty responsible, it's the smaller ones that are suspect.

2. This would make a formalized treaty between the member nations of COCOM more politically appealing. By educating the public on Soviet operations and the implications of technology transfer, public opinion could be mobilized in the West to make it politically appealing to formally control "dual-use" exports.

An initiative to revitalize COCOM by Ambassador Allen Wendt was based on improved public understanding of COCOM objectives and a common standard level of effective protection for all exports of controlled strategic commodities. He said,

> ...our general public does not know very much about our export program, especially its purpose and specific objectives. The only time people hear about export controls is when the media cover some spectacular illegal sale or diversion of sensitive equipment. It is ironic that the Soviets may be far better informed about our control system that is the U.S. public.
>
> This is a situation that is not unique to the United States. We believe there should be increased public awareness of the purpose and goals of our control system

and COCOM. I can tell you this is a sensitive subject with some of our COCOM partners.[1]

If this initiative can be implemented both within the United States and among the membership of COCOM, the general public may support a stronger policy of denying sensitive technology to the Soviet Union. The policy of treating COCOM as a semi-secret organization has effectively worked against building public support for COCOM.

B. PROPOSITION 2--THE BIGGEST LEAKERS HAVE A MORE COMMERCIAL ORIENTATION THAN OTHER COUNTRIES

This may be somewhat self-induced, since following World War II, the United States was responsible for the Japanese system of government and partially responsible for the West German system. These two countries were both reconstructed with the United States playing the dominant role in providing the national security, while each country picked up the pieces economically also with help from the United States. From this came the system that exists today, where the United States plays the dominant role in both NATO and the United States/Japanese security treaty.

It shouldn't surprise anyone that the commercial/economic perspective will play the biggest role within international relations of countries that have this luxury. How can the United States expect any conscientious export

---

1. Allen Wendt, "Export Control Policy and COCOM," Current Policy No. 1031, United States Department of State, Bureau of Public Affairs, Washington D.C., 19 November 1987, p. 2.

control system that's charged with monitoring strategic trade to work, when the bureaucracy designed to do so, bypasses anyone qualified enough to identify the export as strategic? As mentioned earlier both the West German and the Japanese systems do just that.

When these countries send representatives to the COCOM negotiations, their representatives come from the commercial sector who seek to benefit from the most lax control list possible. It becomes very difficult to explain the strategic reasoning for controlling the export to a representative that thinks in only dollars and cents. These representatives come from the exact industries that the United States is seeking to control.[2]

Technology control, although extremely important, is handled at a very low level in COCOM governments. The priority is toward increasing sales and the benefits of controlling strategic exports are not realized. "Defense budgets could be cut in half, but the allies won't adjust to this because they don't spend much on defense."[3] This commercial orientation puts a heavy strain on the negotiation process within COCOM. Mr. Maloof says,

---

2. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

3. Interview with Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and Former Director, Defense Technology and Security Administration, 7 February 1989.

> ...with the exception of Great Britain and France, COCOM allies very rarely come with a proposal to add to the list. The amount of decontrol proposals are completely out of hand. There is a big push to diminish the list to as few items as possible, wholesale decontrol with no strategic rational.[4]

This perspective will continue to be dominant in countries where industry and business executives think only in the commercial/economic benefits of doing business with the Soviet Union and not on the national security repercussions.

1. Recommendations

There needs to be an increased education effort implemented to inform all industry officials of the national security implications of doing business with the Soviet bloc. This is especially necessary since Gorbachev is allowing Soviet representatives to deal directly with these industries. Corporations have to be made to realize that it is their obligation to do their part to control their strategic technology. They also should be made aware of the fact that any innovation that makes its way East will most likely be used to improve the Soviet military industrial complex.

Once this effort is complete and specific technologies are identified, COCOM should concentrate on those items with a clear and concise enforcement effort, unrelated to foreign policy. When the United States mixes

---

4. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

their foreign policy concerns with technology transfer, the allies don't buy it. The allies feel that immigration and human rights are totally unrelated to the export of strategic technology.[5] By identifying the very critical items and maintaining a coherent policy in the technology transfer area, this will have a solidifying effect among the membership of COCOM.

C. PROPOSITION 3--A TOTAL LACK OF ANY NATIONAL SECURITY OR MILITARY ORIENTED PERSPECTIVE OR OPINION WHEN CONDUCTING EXPORT TRANSACTIONS

This problem is directly related to the previous, where a national security perspective is completely cut out of the loop, such as in the case of Japan and West Germany. Earlier, in the case of France, Mr. Bryen mentioned that the reason for the improvement of French controls was because of the influence of a certain general. In the United States as well as Great Britain the military point of view gets equal time with the commercial/economic perspective in the formulation of export policy. The term "dual-use" specifically infers a military application in its definition. Yet, a military perspective on the repercussions of selling a strategic technology is not addressed in either Japan or West Germany.

---

5. Interview between Mr. Dan Hoydysh, Director, Office of Technology and Policy Analysis, Department of Commerce, and the author, 8 February 1989.

With the rare exception of Great Britain and France, the United States is the only country that comes into COCOM negotiations with the strategic criteria to maintain certain control limits over Soviet targeted technology and commodities. The allies, again with the exception of U.K. and France, do not provide strategic justification either to decontrol a technology or to lift the technical limits of that strategic technology or commodity.[6]

Despite the effort of the United States to get Ministries of Defense more involved into COCOM affairs, Ministries of Trade are the predominant voice in formulating most allied countries strategic control lists. Mr. Maloof is very adamant when he says,

> Except to the U.K. and France, defense has little if any influence in formulating individual member control policies. We are always on the defensive in these negotiations, defending our position for maintaining stronger controls. The U.S. defensive umbrella is a way of life, a luxury.[7]

1. Recommendations

As mentioned before in the previous two problems, the key needs to be education, both for the general population and the corporations. With this education, the benefits of having a national security perspective cut into

---

6. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

7. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

the decision making loop should be readily apparent. As it stands right now, the countries who already have this national security input are at an extreme disadvantage, both from the military perspective and the commercial/economic perspective. If an ally sells a particular technology it affects the national security of the entire alliance. Yet, this same sale would not be approved by any country within the alliance that maintains a military input. This shows that the country who obeys the law is unfairly treated.

D. PROPOSITION 4--THE SPECIFIC COUNTRY'S POLITICAL WILL AND PERCEPTION OF THE THREAT

This is the most important concept in controlling strategic technology. As mentioned earlier, West Germany, who views itself as a divided nation with East Germany, is not likely to take as hard a stand on strategic technology transfer for reasons previously discussed. Japan, who has enjoyed enormous economic success since World War II, finds it very hard politically to control trade and exports, when trade and exports are the foundation of their success. Gorbachev and the Soviet Union have played on these various issues within each country to give the Soviet Union a less threatening appearance.

Along with each country's perception of the threat, come their visa policies. The allies are letting an increasing amount of Eastern bloc nationals into their country. The volume of approved visas has far outstripped the ability of

the system to review applications. Approvals are out of control, without any COCOM control. "East bloc nationals are granted a visa to look at a shoe lace factory only to be found where they weren't supposed to be."[8] This allows East bloc nationals access to Western technology, without COCOM approval. The consequences of this policy apparently aren't considered by the allies or their perception of this threat appears to be minimal.

1. Recommendation

In order to take advantage of decreasing political will among some allies, tie export controls to arms control negotiations. If the United States and the West are politically forced to reduce their military capability, in the era of anti-nuclear sentiment and arms reduction agreements, then tie it into increased and stronger "dual-use" strategic technology export controls.

The more arms-control agreements that are signed, the more imperative "dual-use" technology controls become. As mentioned before, "dual-use" technologies are directly related to improving conventional arms, which the Soviet Union have the distinct advantage in quantity. To improve the Soviet quality of these conventional army by lax export controls would be criminal.

---

8. Interview with Mr. Michael Maloof, Director, Technology Security Operations, Defense Technology and Security Administration, 10 February 1989.

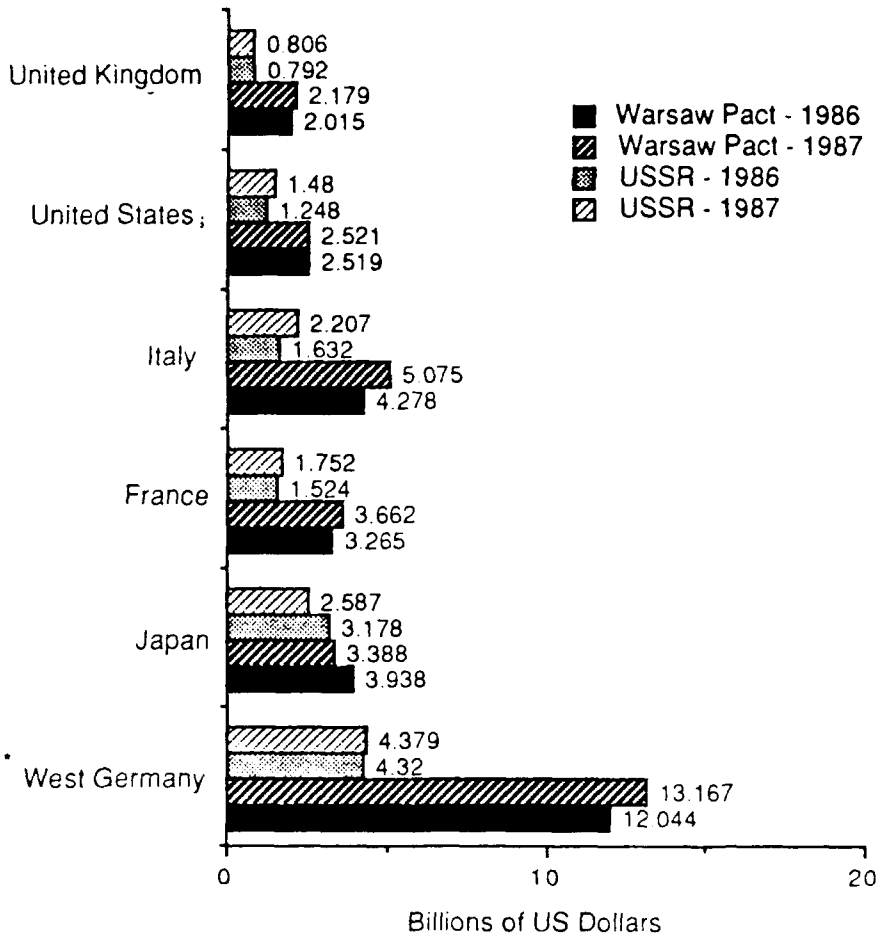
In order to ride the European de-nuclear/arms reduction sentiment, it may be able to be focused into strict technology controls, possibly even to the point of amending the right to export in the West German constitution. To have one without the other further jeopardizes Western security.

E. PROPOSITION 5--A COUNTRY'S TECHNOLOGICAL PROFICIENCY AND INDUSTRIAL BASE

A prerequisite to illegal technology diversion that cannot be escaped is a country's technological proficiency and industrial capability. If a nation intends to be technologically proficient as all Western nations strive to be, then they will continue to be targets. The bigger the technical and industrial base the bigger the target. The United States is presently the biggest target, ' 't Japan is continuously growing. The difference is the United States has the best export controls of any country within COCOM, Japan substantially less as previously discussed. This does not discount countries who do not have any technical base, since they can act as illegal diversion points.

F. PROPOSITION 6--THE AMOUNT OF TRADE THAT A SPECIFIC COUNTRY DOES WITH THE SOVIET BLOC

Figure 1 shows the amount of trade that countries within COCOM have with the USSR and other countries of the Warsaw Pact. It seems that the countries that leak the most, do the most trade with the Soviet Union. It is easier to



* West German Figures Do Not Include Trade With East Germany

Figure 1. COCOM Trade with USSR/Warsaw Pact

divert an illegal shipment, disguised as a normal transaction, than it is to generate an illegal transaction from scratch. The Toshiba incident was an example of this where both the milling machines and the computer controls were disguised as legal exports. This is especially the case where technology has progressed to the point where the customs inspectors are incapable of recognizing a more capable machine from a less capable machine. West Germany and Japan are the two Western countries that trade the most with the Soviets.

1. Recommendation

Try to encourage more trade with the West as well as between the membership in general. It would be virtually impossible to infringe on a specific country's sovereignty by telling them who to trade with. But there is an effort within the membership of COCOM to streamline the control list, in an effort to achieve better standardization. This, along with reduced controls for inter-membership trade, hopefully will make it easier to conduct trade among the partners and reduce trade with the Soviet bloc. This might not come to pass because all Western countries previously mentioned already do significantly more trade with the United States than the Soviet bloc. Making it easier to conduct trade among the membership won't mean a thing if a country isn't going to observe the COCOM rules in the first

place, especially if the Soviets are willing to pay high prices for the commodity.

Looking at Figure 2, all countries previously mentioned already do quite a bit more trade with the United States than the Soviet bloc. It seems that these countries would be more receptive to maintaining their American market, than risking an illegal diversion to the Soviet bloc. With the exception of West Germany, complying with COCOM rules only affects a small portion of their entire export market. As mentioned earlier, the Japanese went to great lengths to calm the furor over the Toshiba incident that had the potential to do significantly more damage to their economy than the benefits of any sale to the Soviet Union.

EXPORTS TO THE U.S.	1986	1987 (Millions of U.S.$)
FRANCE	8,832	10,415
ITALY	10,504	11,176
GREAT BRITAIN	15,312	18,195
WEST GERMANY	25,519	27,877
JAPAN	81,926	85,017

Figure 2. Exports to the United States

G. PROPOSITION 7--THE SPECIFIC COUNTRY'S EXPORT PROCESS, LAWS AND SANCTIONS AGAINST VIOLATORS

This weakness was previously identified in both Japan and Germany. Italy also has never prosecuted anyone for an

export violation. Compared to the United States there has been almost no prosecutions in COCOM countries. Yet we do the least amount of trade with the Soviet bloc. If the United States can indict 192 cases since 1981, it is the opinion of the author that the allies are either incompetent or derelict in their responsibility of enforcing the laws they agreed to enforce.

1. Recommendation

It seems that the only way U.S. export officials have been able to get the allies to comply with COCOM regulations is with public opinion. In both the Toshiba incident and the Libyan Chemical Plant incident, neither government took action until public opinion became so great that action had to be taken. This does not help relations between the two governments, but it is the only pressure that has made them take any effort to bolster their trade controls.

Sanctions against violators are the key. The only way you will be able to stop the flow of strategic technology to the Soviet Union is to increase the consequences of doing business with them, and enforce it. Sanctions aren't worth the paper they are printed on unless they are strictly enforced. Some countries previously mentioned have never employed an export sanction. The lack of enforcement by any one member of COCOM directly affects the control initiative of the whole membership in general.

H. THE SPECIFIC COUNTRY'S PARTICIPATION IN COCOM AND THEIR HISTORY OF EXPORT VIOLATIONS

The history of export violations was previously addressed. Each country's participation in COCOM, specifically cases submitted for COCOM consideration, shed the most light on the inequity of the situation. If you take the amount of trade each country does with the Soviet bloc and compare it to the amount of export applications submitted to COCOM for consideration, you will find that the United States submits significantly more applications than the nearest member country, yet does 10% of the amount of trade.

Certain member countries, particularly the countries that do the most trade with the Soviet bloc, just don't bother to submit all transactions, thereby bypassing the whole control mechanism. I asked Dr. Bryen, if I took the amount of trade conducted between the Soviet Union and each COCOM country, and compared it to the amount of applications submitted would it tell me anything. "Damn right it will. You'll find that most European countries are under represented compared to the amount of trade they do. Only two countries run anywhere close to reality, that's the U.S. and Great Britain, the rest submit very few."[9] This further validates the accusation that some members of COCOM

9. Interwith with Dr. Stephen D. Bryen, Former Deputy Under Secretary of Defense, and former Director, Defense Technology and Security Administration, 7 February 1989.

knowingly and blatantly violate COCOM restrictions for the economic benefit of the sale. Apparently in their mind the short term economic gain is worth jeopardizing Western security.

1. Recommendation

It is clearly time to inform the public of the situation at hand. In a democratic society public knowledge and support of COCOM would provide the national effort needed to ensure compliance. As a semi-secret organization, COCOM is handcuffing itself and taking away the very ingredient that would ensure enforcement. The organization is only as good as its weakest link, and presently that is not saying very much.

I. CONCLUSION

It is the opinion of the author, when taking into account all propositions previously stated, that West Germany and Japan present the greatest vulnerability when it comes to diverting strategic technology. Although Italy follows a close second, its reputation and technology base isn't as large as Japan or West Germany. France, Great Britain and the United States, although very technologically proficient, have defense department personnel screening export applications. Besides a defensive perspective, the United States and Great Britain provide adequate personnel and funding to back up their export procedures. These two countries also vigorously prosecute export violators,

something Japan has done just once, and West Germany has never done.

Although both West Germany and Japan are taking initiatives to improve their export procedures, one thing must be remembered. In both the Toshiba incident and the Libyan Chemical Plant incident, it was then and it is now against the laws of their respective country's to export those specific technologies without COCOM approval. No amount of effort within the membership to streamline the procedure or narrow the commodity control list would have prevented those transactions. Those companies willfully violated their own country's law, as wells as COCOM regulations. Each incident involved fraud, inadequate means of detection and the inability to prosecute the responsible parties. Unless both West Germany and Japan go to the heart of the problem, instead of just treating the symptom, technology will continue to leak to the Soviet bloc.

Both legal and illegal sales need more attention in the West, but first and foremost are the illegal exports, or the transaction disguised as a legal sale. If the Soviets obtain a technology legally, they get factory representation, service and even warranties, such as they did with the Toshiba incident. If they steal it they have to figure out how to make it work, and they can't call a salesman to complain. These legal, or pseudo-legal sales are doing the most damage and need the most immediate

attention. COCOM is the key, and West Germany and Japan are the places to start.

When trying to convince non-receptive bodies such as the Department of Commerce or some members of COCOM of the need for tighter security controls on exports, examples such as the ones previously discussed seem so obvious considering the assets of Western intelligence agencies. The emphasis the Soviet Union puts on Western technology is too great to overlook. The successes of the Soviet bloc have been astounding, and if overlooked, possibly fatal for the Western alliance. It is not to say that the needs of the Department of Defense should far outweigh those of the Department of Commerce, but that a sufficient compromise position has to be drawn in order to curtail such incidents in the future. This applies not only in the United States, but within the international market place as well. It is within COCOM, as well as within NATO, that we provide a united front against this Soviet effort, and it is only with a united effort that we can win a technology war.

Mr. Maloof made it clear to me that despite the many deficiencies, COCOM was still the only game in town for multilaterally controlling technology. "Yes there have been alot of disappointments, but it seems to be working." Mr. Bryen told me that we would be in much worse shape without the organization. "The allies although reluctant, do respond to our demands." Somehow, as a Naval officer, I

didn't find the words too comforting. I may be one of the officers that have to contend with the quieter, harder to detect Soviet submarines in order to resupply the ally that gave them this increased capability. It is the opinion of the author that this doesn't seem like logical behavior from an ally.

BIBLIOGRAPHY

Books

Barron, John, Breaking the Ring, Boston: Houghton Mifflin Company, Inc., 1987.

Barron, John, KGB Today: The Hidden Hand, New York: Reader's Digest Press, Inc., 1983.

Bertsch, Gary K., East-West Strategic Trade, COCOM and the Atlantic Alliance, Paris: Atlantic Institute for International Affairs, 1983.

Bertch, Gary K. and McIntyre, John R., National Security and Technology Transfer: The Strategic Dimensions of East-West Trade, Boulder: Westview Press, Inc., 1983.

Ellison, Herbert J., Soviet Policy Toward Western Europe, Seattle: University of Washington Press, 1983.

McKitterick, Nathaniel, East-West Trade: The Background of U.S. Policy, New York: Twentieth Century Fund, Inc., 1966.

Mathieson, Raymond S., Japan's Role in Soviet Economic Growth: Transfer of Technology Since 1965, New York: Praeger Publishers, 1979.

Metcalfe, Robyn S., The New Wizard War: How the Soviets Steal U.S. High Technology and How We Give It Away, Redmond, Washington: Tempus Books of Microsoft Press, 1988.

Nove, Alec, East-West Trade: Problems, Prospects, Issues, Beverly Hills: Sage Publications, Inc., 1978.

Office of Technology Assessment, Technology and East-West Trade, United States Congress, New Jersey: Allanheld, Osmun & Co., Inc., 1981.

Perry, Charles M., and Pfaltzgraff, Robert L., Selling the Rope to Hang Capitalism?, New York: Pergamon-Brassey's International Defense Publishers, 1987.

Popper, Steven W., East European Reliance on Technology Imports from the West, Santa Monica: RAND Corporation, 1988.

Possony, Stefan T. and Pournelle, J.E., The Strategy of Technology: Winning the Decisive War, Cambridge: University Press of Cambridge, Inc., 1970.

Roberts, Philip A., Technology Transfer: A Policy Model, Washington, D.C.: National Defense University Press, 1988.

Safarian, A.E. and Bertin, Gilles Y., Multinationals, Governments and International Technology Transfer, New York: St. Martin's Press, 1987.

Samli, A. Coskun, Technology Transfer: Geographic, Economic, Cultural, and Technical Dimensions, Westport: Greenwood Press, Inc., 1985.

Seward, Bernard L. Jr., Technology Control, Competition, and National Security: Conflict and Consensus, New York: University Press of America, Inc., 1987.

Smith, Gordon B., The Politics of East-West Trade, Boulder: Westview Press, Inc., 1984.

Swearingen, Rodger, Siberia and the Soviet Far East, Stanford: Hoover Institution Press, 1987.

Tatsuno, Sheridan, The Technopolis Strategy, New York: Prentice Hall Press, 1986.

Van Oudenaren, John, Soviet Policy Toward Western Europe: Objective, Instruments and Results, Santa Monica: RAND Corporation, 1986.

Weinberger, Casper W., The Technology Transfer Control Program, Report to the 98th Congress, 1984.

Yergin, Angela S., East-West Technology Transfer: European Perspectives, Beverly Hills: Sage Publications, Inc., 1980.

Articles

Abernathy, Wayne, "How Export Controls Defend the National Interest," The Heritage Foundation: Backgrounder, 30 June 1987.

Aeppel, Timothy, "Bonn Reforms Aim to Defuse Furor," Christian Science Monitor, 21 February 1989.

Auerbach, Stuart, "Allied Sales to Soviets Worry U.S.," Washington Post, 27 October 1987, p. A1.

Auerbach, Stuart, "Another High-Tech Sale to Soviets by Toshiba Reported," Washington Post, 20 June 1987, p. C2.

Auerbach, Stuart, "Europeans Sold Gear to Soviets," Washington Post, 22 October 1987, p. A5.

Auerbach, Stuart, "How Toshiba Took the Hill by Storm," Washington Post, 10 January 1988, p. C3.

Bradley, Barbara, "Shipping Sensitive Technology to the Soviet Union--Cases Mount," Christian Science Monitor, 12 November 1987, p. 1.

Browning, E.S., "Four Executives in France are Arrested for Exports of Technology to the Soviets," Wall Street Journal, 25 April 1988, p. 23.

Browning, E.S., "Illicit Sales Made to Soviets by French Firm," Wall Street Journal, 19 October 1987, p. 27.

Bucy, J. Fred, Defense Board Task Force on Export of U.S. Technology, "An Analysis of Export Control of U.S. Technology,: A DOD Perspective," February 1976.

Cahill, Jerome, "Ban on Toshiba Asked in Senate," New York Daily News, 19 June 1987, p. C14.

Carey, Pete, "Soviets Want Fruits of Silicon Valley," San Jose Mercury News, 12 March 1989, p. 1.

Central Intelligence Agency White Paper, "Soviet Acquisition of Military Significant Western Technology: An Update," U.S. Government Printing Office, September 1985.

Ellis, Junius, "Bobby Ray Inman: The Admiral and Ex-CIA Spymaster Talks About Our War with Japan, Soviet Espionage and Lecarre's Truthful Fictions," GEO, May 1984, pp. 18-22.

Engelberg, Stephen, "German Atomic Sale Challenged," New York Times, 1 February 1989, p. A2.

Engelberg, Stephen, "Libyans Reported to Opt for Drugs," New York Times, 2 March 1989, p. A4.

Export Control Enforcement Unit, Internal Security Section, Criminal Division, U.S. Department of Justice, "Significant Export Control Cases, January 1, 1981 to January 23, 1989."

FBIS, "LDP Plans to Submit Amended Antiespionage Bill," Japan Report, 31 March 1986, pp. 38-39.

FBIS, "Recent Status of Industrial Cooperation with USSR," Japan Report, 20 February 1987, pp. 30-36.

FBIS, "USSR Aims at Japan's High Technology," Japan Report, 5 March 1987, pp. 52-57.

"German Concern Finds Link to Libya Plant," New York Times, 1 February 1989, p. A4.

Giblin, James F. Jr., "National Strategies and Japan's Northern Territories," Naval War College Review, Winter 1987, pp. 53-66.

Goldman, Joseph R., "When Capitalist East Meets Communist West," East European Quarterly, Vol. XVIII, No. 2, June 1984, pp. 237-252.

Gordon, Michael R., "German Concern Said to Aid Pakistan A-Weapons," New York Times, 29 January 1989, p. A29.

Gordon, Michael R., "Iran is Expanding Chemical Stocks Used in Poison Gas: Embassy in Bonn is Key," New York Times, 19 January 1989, p. A1.

Greenberger, Robert S., "U.S. Aide Says Allies Too Eager to Relax Limits on Technology Sales to East Bloc," Wall Street Journal, 27 October 1988, p. A19.

Hanson, Philip, "Soviet Industrial Espionage," Bulletin of the Atomic Scientists, April 1987, pp. 25-29.

Heinz, John and Bryen, Stephen D., "U.S. Export Policy and National Security," The Heritage Lectures, 29 July 1987.

Hoagland, Jim, "Libya: The German's Credibility Problem," Washington Post, 26 January 1989, p. 25.

"Japan Alerted to Toshiba's Exports to Soviets," Baltimore Sun, 3 July 1987, p. 1D.

Johnson, Chalmers, "Japanese-Soviet Relations in the Early Gorbachev Era," Asian Survey, Vol. XXVII, No. 11, November 1987, pp. 1145-1160.

Kamm, Henry, "Glasnost Divides East German Officials," New York Times, 8 March 1989, p. A6.

Kempe, Frederick, "Russian Campaign, Moscow's Bid to Close Its Technology Gap Will Test Gorbachev," Wall Street Journal, 6 June 1985, p. 1.

Konfala, John, "A Defense Department Perspective on Export Controls (II)," in: Bernard L. Seward, Jr., Technology Control, Competition, and National Security: Conflict and Technical Dimensions, Westport: Grenwood Press, Inc., 1985.

I.A.P., "All Aboard the Japan Transfer," Technology Review, May 1982, p. 80.

Lindstrom, Talbat S., "A Defense Department Perspective on Export Controls," in: Bernard L. Seward, Jr., Technology Control, Competition, and National Security: Conflict and Technical Dimensions, Westport: Grenwood Press, Inc., 1985.

McCartney, Robert J., "Bonn's 'Benign Neglect' on Poison Gas Assailed," Washington Post, 29 January 1989, p. A29.

McCartney, Robert J., "Bonn Concedes Libyan Plant Can Make Chemical Weapons," Washington Post, 1 February 1989, p. A18.

McCartney, Robert J., "New Evidence Strengthens Suspicions of Firm's Links to Libya," Washington Post, 1 February 1989, p. A18.

McCartney, Robert J., "W. Germany Assails U.S. on Libyan Plant, Bonn Government Angered by News Leaks," Washington Post, 7 January 1989, p. A14.

Mann, Jim and Pine, Art, "Japan Seeks Wider International Role," Manchester Peninsula Herald, p. 2.

Markham, James M., "Bonn is to Review American Evidence on Libyan Plant," New York Times, 6 January 1989, p. A1.

[illegible], John, "U.S. [illegible] Urged on Export Rules of Technology," [illegible], [illegible] 1988, p. 1.

Weinraub, Bernard, "Bonn's Proliferation Policy," New York Times, 2 February 1989, p. A10.

Moore, James F. [illegible] "A Defense Department Perspective on Export Controls (II)," in: Bernard L. Seward, Jr., Technology Control, Competition, and National Security: Conflict and Technical Dimensions, Westport: Grenwood Press, Inc., [illegible].

Murray, Warren, "The Trial of Soviets' Global Spy Masters," [illegible], 18 April 1988, pp. [illegible].

"Norwegian Defense Firm Stops Sales to Communist Nations," Detroit News, 18 June 1987, p. 3.

Oberdorfer, Don, "West German Firm Reportedly Sent India Atom Arms Material," Washington Post, 1 February 1989, p. A19.

Oka, Takashi, "Toshiba Whistle Blower Defends Decision to Expose Companies," Christian Science Monitor, 22 July 1987, p. 28.

Outreach Directorate, Defense Technology and Security Administration, Pamphlet, p. 4.

Polmar, Norman, "The Soviet Navy: The New Carrier," Proceedings, August 1986, p. 66.

Pond, Elizabeth, "In Bonn, Shevardnadze Pushes Arms Cuts," Christian Science Monitor, 20 January 1988, p. 7.

Safire, William, "Stop the Todeskramer," New York Times, 16 January 1989, p. 15.

Sanger, David E., "A Bizarre Deal Diverts Vital Tools to Russians," New York Times, 12 June 1987, p. Q2.

Sanger, David E., "For Japan, Military Challenge is Balancing Might and Image," New York Times, 6 March 1989, p. 1.

Scheck, Jennifer, "Soviets Aim at Undermining West European Support of U.S. Export Control Policies," Research Notes, Russian Studies Center, 28 June 1985.

Schmemann, Serge, "Angst and Anger in Bonn," New York Times, 16 January 1989, p. A1.

Schmemann, Serge, "Bonn Raids 3 Concerns in Inquiry on Ties to Building of Libya Plant," New York Times, 26 January 1989, p. A1.

Schmemann, Serge, "Bonn Will Tighten Curb on Exports of Deadly Goods," New York Times, 11 January 1989, p. A1.

Schmemann, Serge, "German Whose Company is Tied to Libya Apparently Tries Suicide," New York Times, 18 February 1989, p. A2.

Schmemann, Serge, "In Chemical Maker's Town, Germans Silently Disbelieve," New York Times, 17 January 1989, p. A1.

Schmemann, Serge, "Letter Indicates More Links Between Gas-Plant Builders," New York Times, 17 January 1989, p. A12.

Sherrid, Pamela, "Tackling the Technobandit at Lower Cost," U.S. News & World Report, 1 February 1988, p. 36.

Silverberg, David, "Results Mixed on Norwegian Push to Stem Technology Leak Damage," Defense News, 29 June 1987, p. 4.

Smith, R. Jeffery, "West Germany to Admit Firms Aided Libyan Chemical Plant," Washington Post, 11 February 1989, p. A20.

Sneider, Daniel, "Japan Curbs Sales of Illegal Technology to Soviet Bloc," Christian Science Monitor, 30 March 1988, p. 1.

"Soviet Naval Construction Slows but Threat Grows," International Defense Review, May 1985, p. 36.

Sternheimer, Stephen, "From Dependency to Interdependency: Japan's Experience with Technology Trade with the West and the Soviet Union," Annals of the American Academy of Political and Social Science, Vol. 458, November 1981, pp. 175-186.

Tagliabue, John, "A German Magazine Names 4 as Soviet Spies," New York Times, 18 May 1983, p. A5.

"Technology Exports: Will Japan Tighten Tech. Security," Research and Development, September 1987, p. 39.

Tharp, Mike, "Invented in Japan; Tokyo, After Buying Technology for Years, Now Exports Its Own," Wall Street Journal, 23 June 1980, p. 1.

"The Soviet Aircraft Carrier--An Update," Naval Forces, Vol. III, No. II, 1986, p. 111.

Tow, William T., "U.S.-Japan Military Technology Transfers: Collaboration or Conflict?", Journal of Northeast Asian Studies, Vol. II, No. 4, December 1983, pp. 3-19.

Triplett, William C. II, "Crimes Against the Alliance," Policy Review, Spring 1988, pp. 8-13.

Wendt, Allen, "Export Control Policy and COCOM," Current Policy, No. 1031, Bureau of Public Affairs, U.S. Department of State, Washington, D.C., 19 November 1987.

Wendt, Allen, "U.S. Export Control Policy: Its Present and Future Course," Current Policy, No. 1984, Bureau of Public Affairs, U.S. Department of State, Washington, D.C., 14 June 1988.

Wendt, Allen, "U.S. Stance Toward the Soviet Union on Trade and Technology," Current Policy, No. 1128, Bureau of Public Affairs, U.S. Department of State, Washington, D.C., 27 October 1988.

"West Germans Uncover Computer Spy Ring," Monterey Peninsula Herald, 3 March 1989, p. 1.

Witter, Willis, and Morrison, James, "French Seize Tool Executives in High-Tech Sales to Soviets," The Washington Times, 22 April 1988, p. 1.

Interviews

Bryen, Dr. Stephen D., Former Deputy Under Secretary of Defense (Trade Security Policy), and Former Director Defense Technology and Security Administration, 1600, 7 February 1989.

Dackiw, Ms. Oksana A., Strategic Trade Analyst, Defense Technology and Security Administration, 10 February 1989.

Hoydysh, Mr. Dan, Director, Office of Technology and Policy Analysis, Department of Commerce, 8 February 1989.

Maloof, Mr. Michael, Director, Technology Security Operations, Defense Technology and Security Administration, 1500, 10 February 1989.

Sulzynsky, Mr. Wolodymyr R., Trial Attorney, Export Enforcement Unit, Internal Security Section, Criminal Division, Department of Justice, by telephone, 9 February 1989.

Congressional Testimony

Daniel, Dan, Representative--Virginia, Statement before the House Armed Services Committee, H.R. 2938 and H.R. 2974, 22 July 1987, p. 2.

Heinz, Senator, Rebuttal on the Senate floor, of Assistant Secretary of Defense, Richard Armmitage assessment of the damage done by the Toshiba/Kongsberg sale, Congressional Record--Senate, Wednesday 16 March 1988, p. S2355.

Helms, Jesse, Senator--North Carolina, "Toshiba--A Pattern of Betrayal," Congressional Record, 19 June 1987, p. S8372.

U.S. Congress, Senate Committee on Governmental Affairs, Permanent Sub-Committee on Investigations, Foreign Missions Act on Espionage Activities in the United States, Hearings, Washington, D.C.: Government Printing Office, 1986, p. 103.

Radio Shows

Bryen, Steven, "The Toshiba Case of Transfer of High Technology," NPR Radio, WETA FM, Washington, D.C., 27 June 1987.

INITIAL DISTRIBUTION LIST

		No. Copies
1.	Defense Technical Information Center Cameron Station Alexandria, Virginia 22304-6145	2
2.	Library, Code 0142 Naval Postgraduate School Monterey, California 93943-5002	2
3.	Prof. Edward Laurance, Code 56Lk Department of National Security Affairs Naval Postgraduate School Monterey, California 93943-5000	5
4.	Prof. Robert Looney, Code 56Lx Department of National Security Affairs Naval Postgraduate School Monterey, California 93943-5000	4
5.	Mr. Michael Maloof Director, Technology Security Operations Defense Technology Security Administration 400 Army Navy Drive Arlington, Virginia 22202-2803	1
6.	Dr. Stephen Bryen Delta Tech. Corporation 1111 Jefferson Davis Highway, Suite 801 Arlington, Virginia 22202	1
7.	Dr. Oksana A. Dackiw Defense Technology Security Administration 400 Army Navy Drive Arlington, Virginia 22202-2803	1
8.	Mr. Stan Hicks Naval Office of Technology Transfer and Security Assistance Washington, D.C. 20360-5000	1
9.	Deputy Chief of Naval Operations (Plans, Policy and Operations) Department of the Navy Washington, D.C. 20350	1

10. Lt. Warren E. Rhoades III 2
SMC # 1469
Naval Postgraduate School
Monterey, California 93943-5000

11. Prof. James J. Tritten, Code 56Tr 1
Department of National Security Affairs
Naval Postgraduate School
Monterey, California 93943-5000